Ground Water/UIC Section

Uranium In-Situ Solution Mining

Kingsville Dome's PA-3 Data Review Effort Prompted By a Citizen's Complaint - (A Work in Progress)

EPA, Region 6
Dallas, Texas

José Eduardo Torres
Petroleum Engineer
Chemical Engineer

The Uranium In-Situ Solution Mining Process (aka ISL or ISR)

Uranium ore may exist in drinking water aquifers from where it can be mined using an In-Situ Solution Mining Process. An oxidizing mining solution is injected through Injection Wells, and the generated uranium rich solution is pumped to the surface through Production Wells. Injection and Production Wells may be arranged in regular patterns within designated “Wellfields”. The injected mining solution may impact the aquifer in all directions around the injection wells (radial flow may be possible inside the aquifer’s rock formation, see Slide 3).

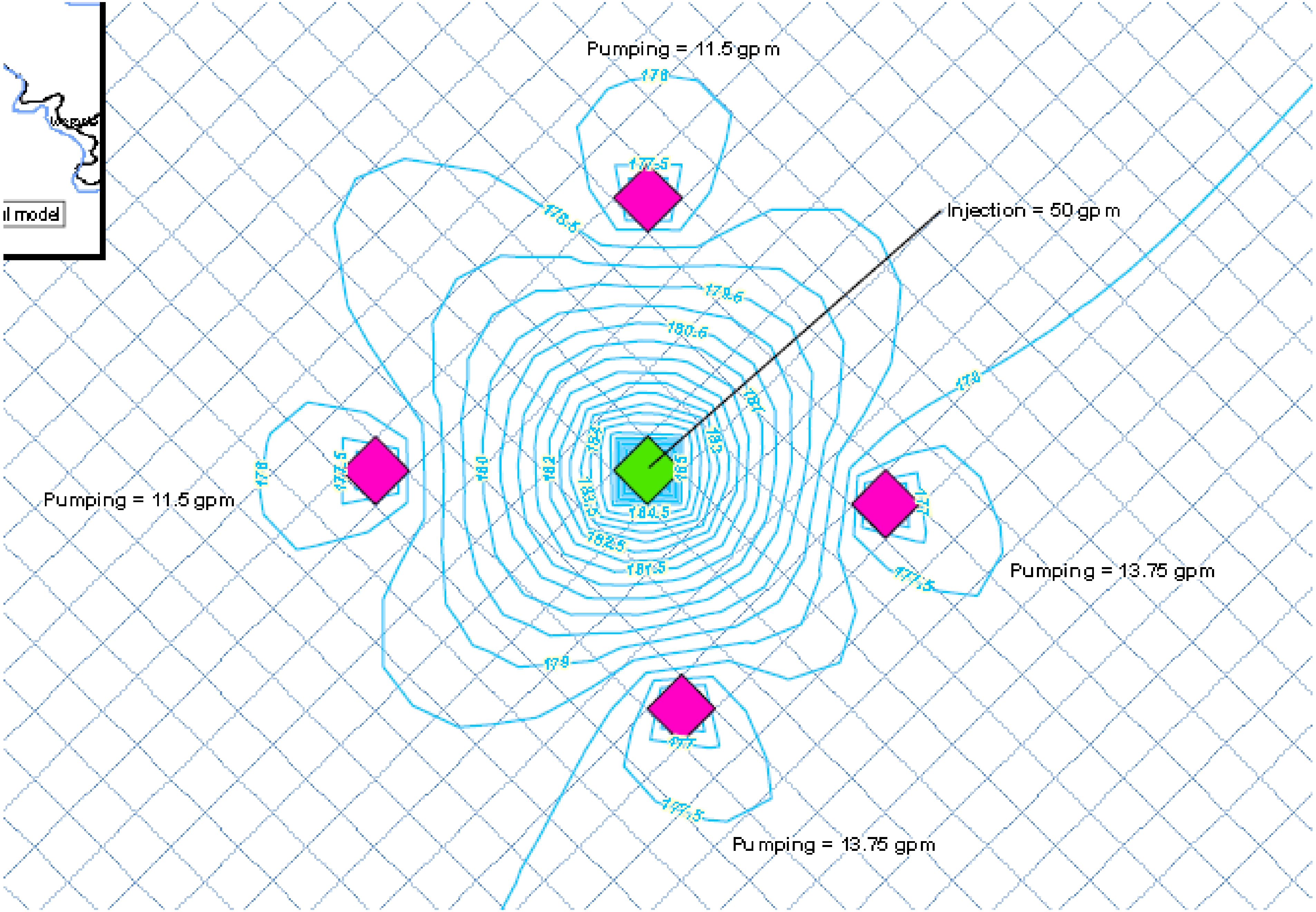
A ring of Monitoring Wells is installed around the Injection and Production Wells to assist in verifying that no mining solutions flow outside the boundaries of the intended mining area (verification of no excursions). Water Quality is determined at these Monitoring Wells (MWs) and other locations (using Baseline (BL) Wells), prior to the initiation of mining operations, in order to determine the aquifer’s baseline (pre-mining) Water Quality conditions.

Slides 4, 5 and 6 illustrate an oxygen supply system, a portion of a field’s mining solution and oxygen distribution system and Injection and Production Wells (see highlighted wellheads).

The map in Slide 8 illustrates an actual Uranium in-situ Solution Mining operation: Production Area No. 3 (PA-3) at the Kingsville Dome (KVD) mining site in Kleberg County, TX. Based on this map, it can be said that in this operation the wells are not arranged in a regular pattern (Slides 3 and 7). Slide 9 illustrates a portion of the map in Slide 8. It provides a closer look at the Monitoring Wells and the Injection and Production Wells. It also illustrates the location of some Baseline Wells inside a “Wellfield” (presumably, an ore rich portion of the aquifer).

The Cross Section seen in Slide 10 illustrates the Pressure Gradients that should ideally be present within the mining area in a “Well Run” in-situ Solution Mining Operation. The above Pressure Gradients need to be carefully controlled in a way that prevents the movement of Mining Area Fluids past the Monitoring Wells (no excursions). In order to accomplish this, wells must be strategically located and injection and production rates must be carefully controlled so that critical flow patterns within the aquifer can be induced and maintained. Also, there must be an efficient Water Quality Monitoring Program in place for the Monitoring Wells, so that excursions can be detected. In addition, defining valid constituent Upper Control Limits is critical to the efficiency and success of the Water Quality Monitoring Program.

A “Well Run” uranium in-situ solution mining operation should result in the recovery of an essential energy mineral (seen in Slide 11) without detriment to ground water resources of drinking quality, which are indispensable for supporting healthy life in the surrounding areas.

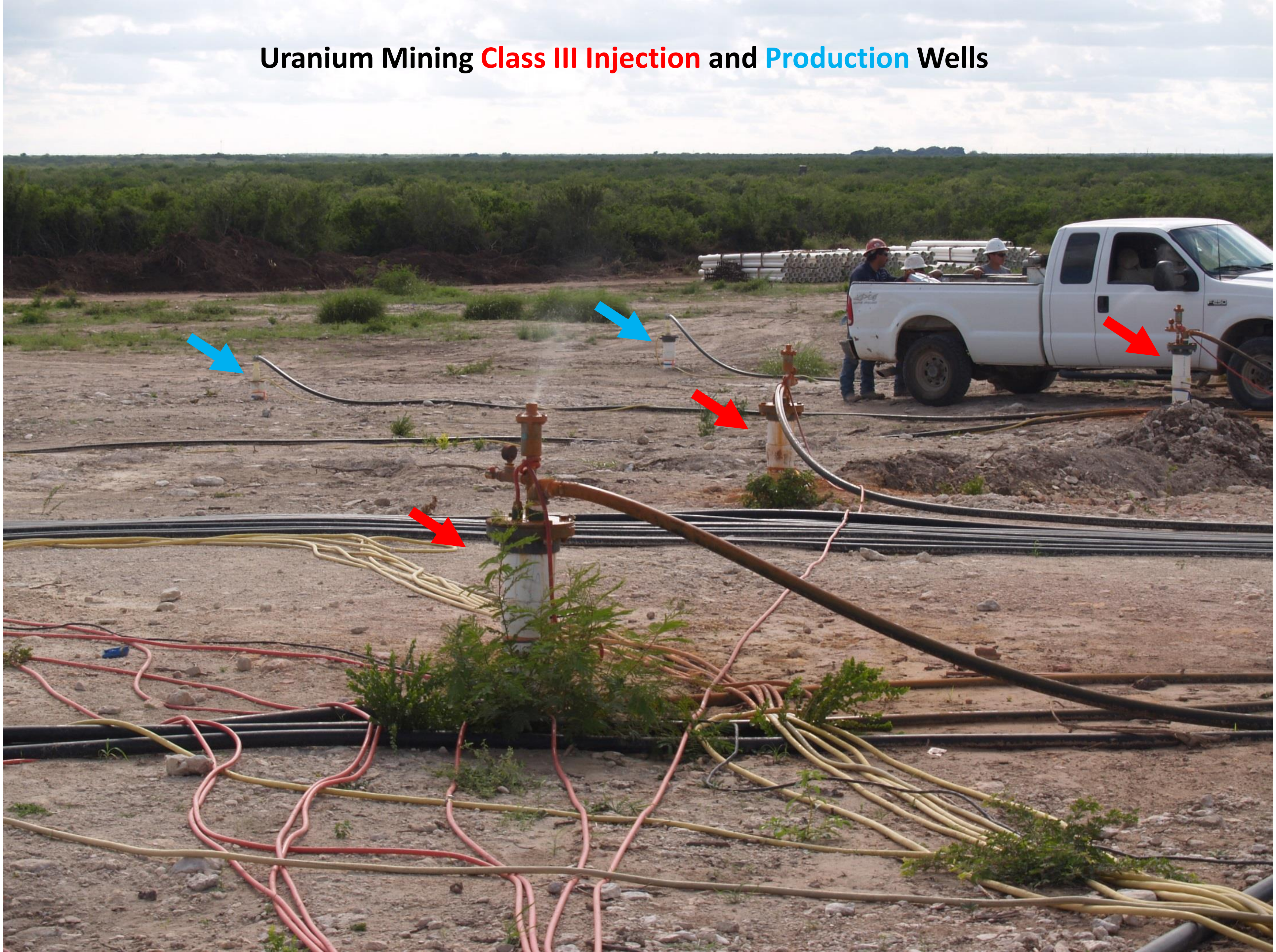


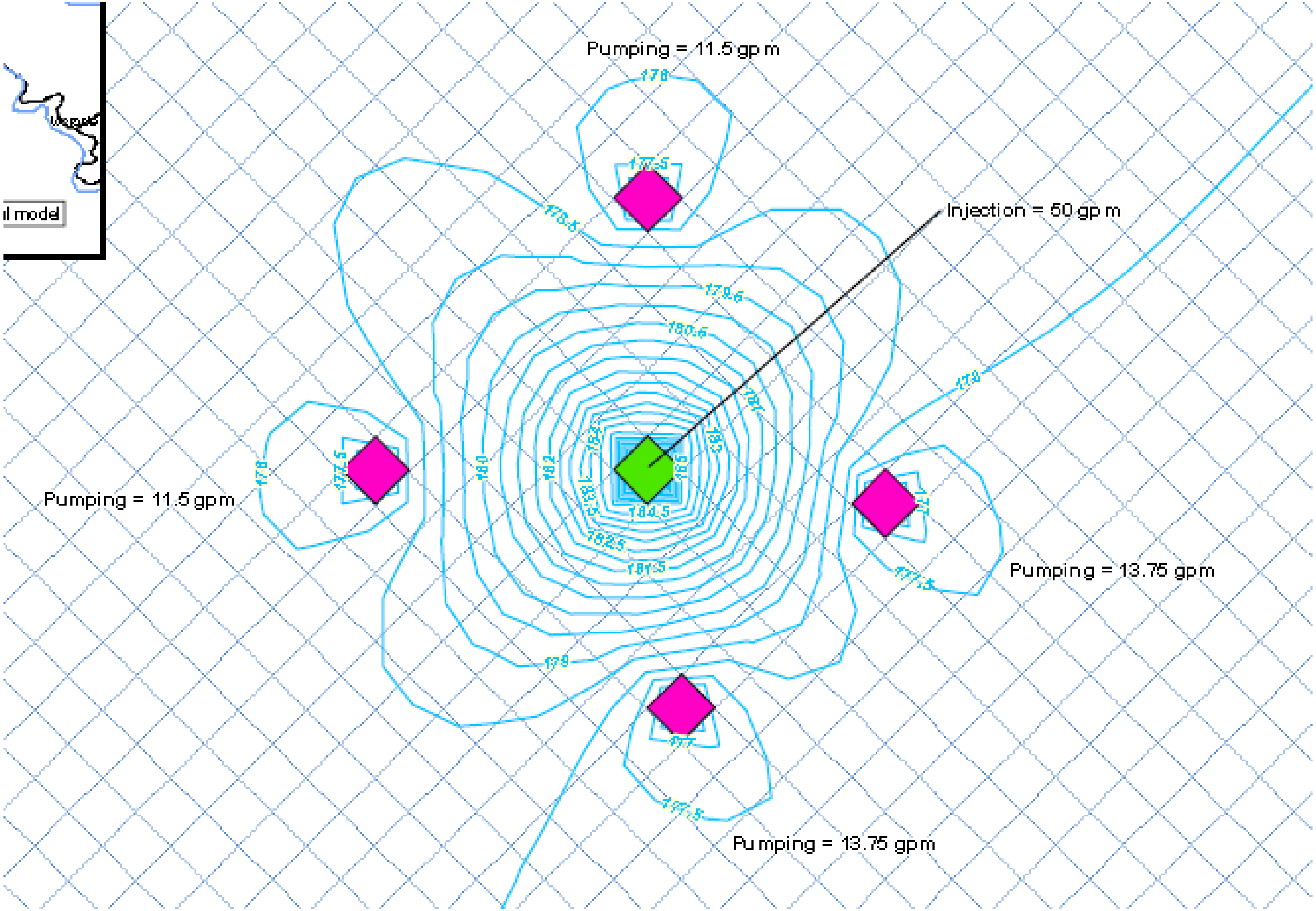
Pumping = 11.5 gpm
Injection = 50 gpm
Pumping = 11.5 gpm
Pumping = 13.75 gpm
Pumping = 13.75 gpm

Oxygen Supply Vessels

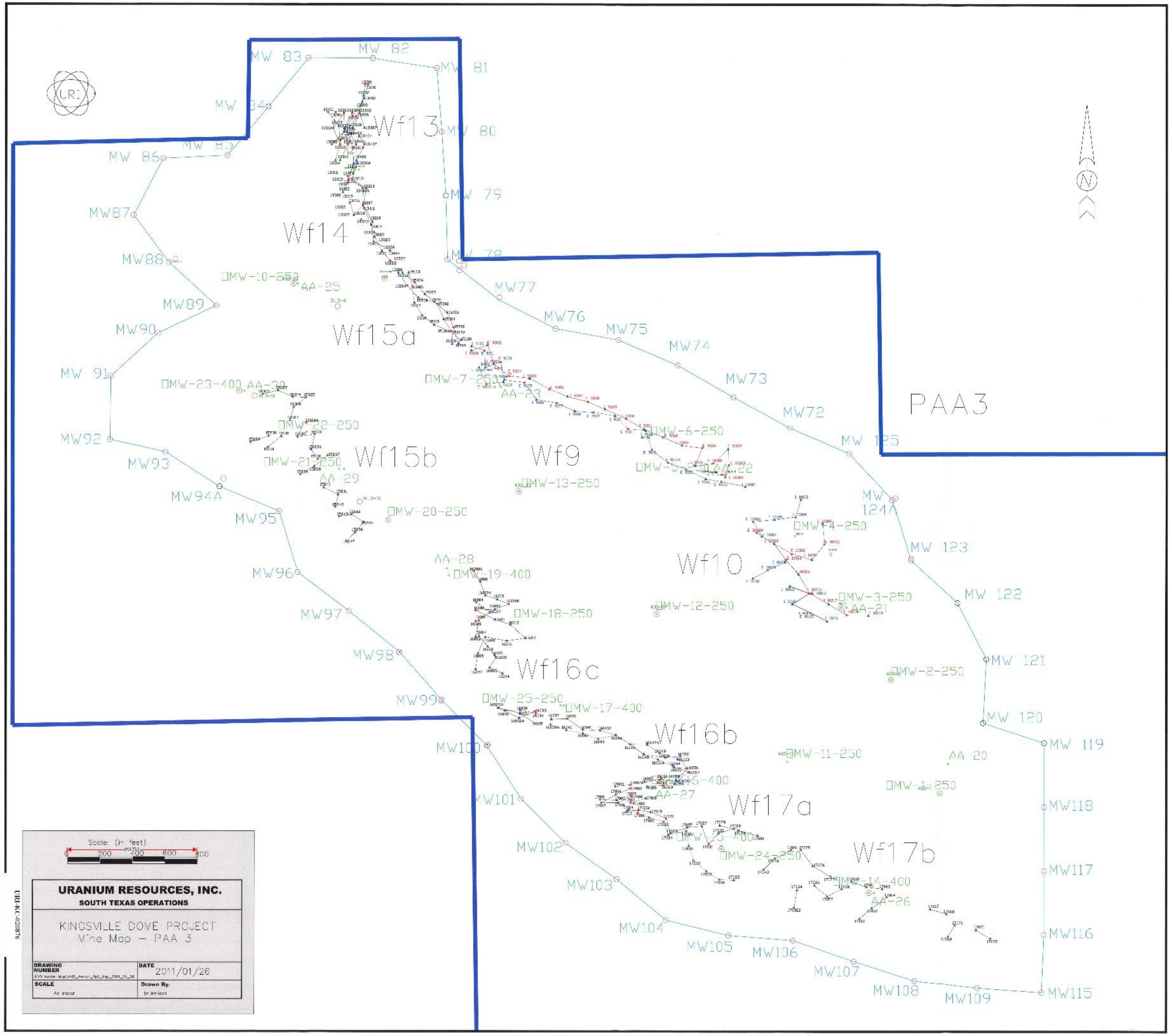
Mining Solution and Oxygen Injection Manifolds

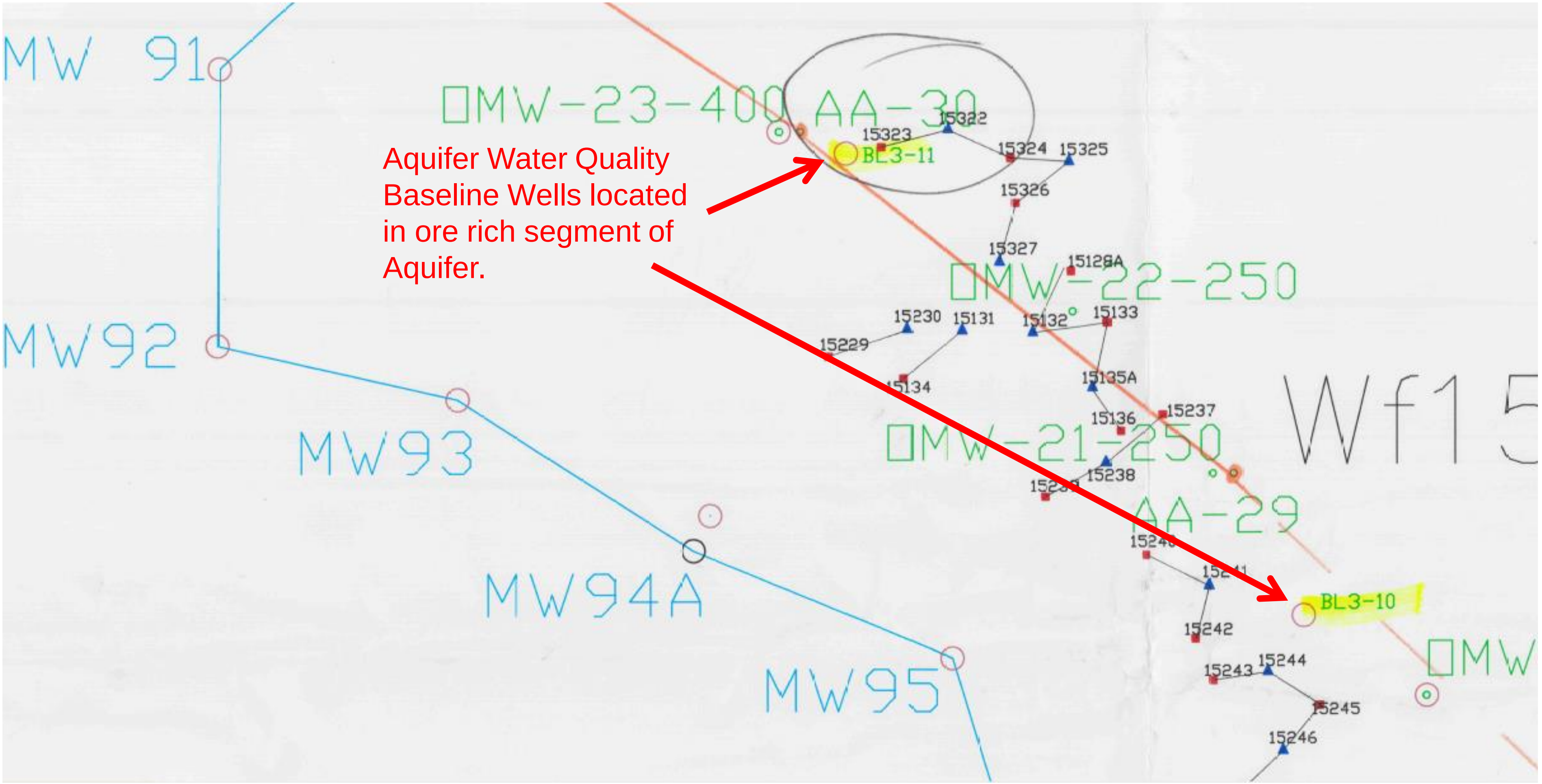
Uranium Mining Class III Injection and Production Wells





Pumping = 11.5 gpm
Injection = 50 gpm
Pumping = 11.5 gpm
Pumping = 13.75 gpm
Pumping = 13.75 gpm


URI
N
PAA3
Wf13
Wf14
Wf15a
Wf15b
Wf9
Wf10
Wf16a
Wf16b
Wf17a
Wf17b
MW 83
MW 82
MW 81
MW 84
MW 80
MW 85
MW 86
MW 79
MW87
MW 78
MW88
MW77
MW89
MW76
MW75
MW90
MW74
MW 91
MW73
MW72
MW92
MW 125
MW93
MW94A
MW 124A
MW95
MW 123
MW96
MW 122
MW97
MW98
MW 121
MW99
MW 120
MW 119
MW100
MW101
MW118
MW102
MW103
MW117
MW104
MW116
MW105
MW106
MW107
MW108
MW109
MW115
MW-10-250
AA-25
MW-23-400
AA-30
MW-7-250
AA-23
MW-22-250
MW-6-250
MW-21-250
AA-29
MW-13-250
MW-20-250
MW-4-250
AA-28
MW-19-400
MW-3-250
MW-18-250
MW-12-250
AA-21
MW-2-250
MW-25-250
MW-17-400
MW-11-250
AA 20
AA-27
MW-1-250
MW-24-250
MW-14-400
AA-26
Scale: (in feet)
0 200 400 600 800
URANIUM RESOURCES, INC.
SOUTH TEXAS OPERATIONS
KINGSVILLE DOVE PROJECT
Mine Map – PAA 3
DRAWING NUMBER
DATE
2011/01/26
SCALE
As shown
Drawn By:

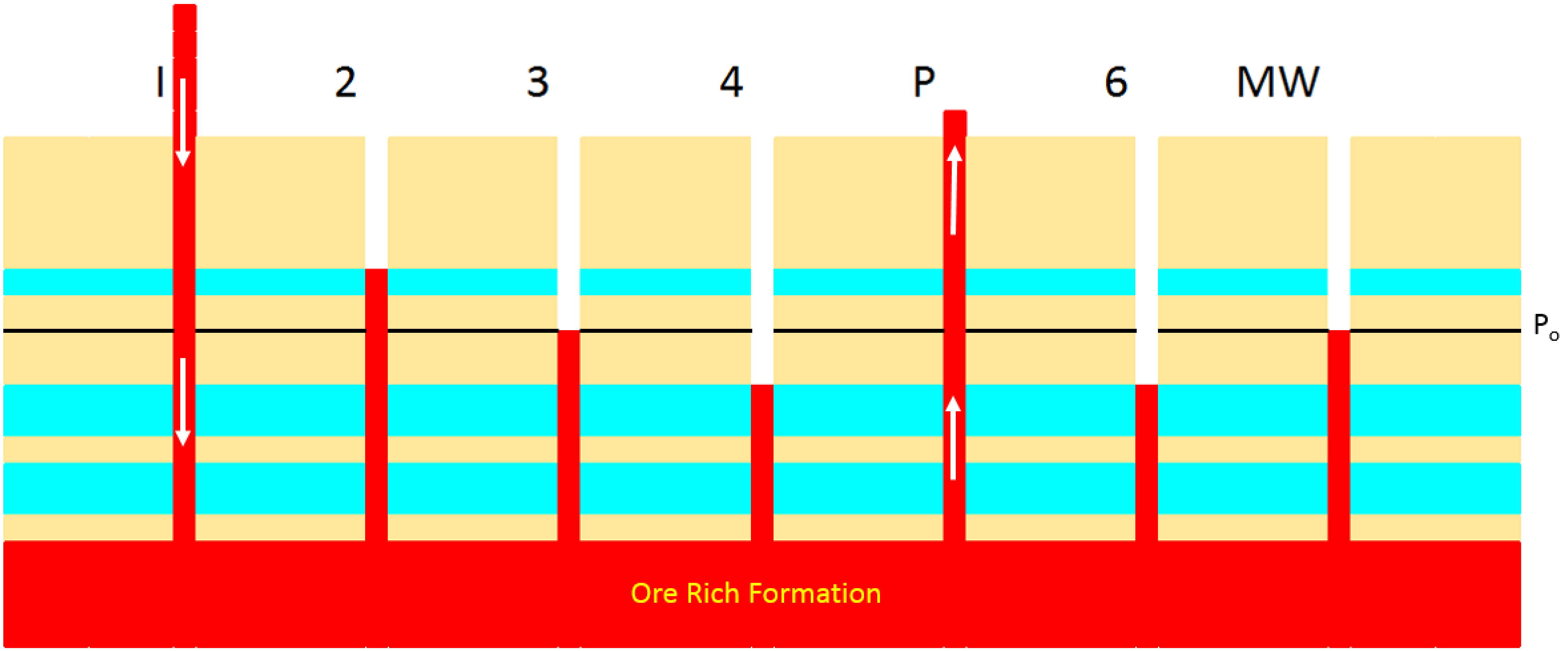


Segment of Well Field 15b of PA-3 in the KVD uranium mining site, Kleberg County, illustrating the location of two Water Quality Baseline Wells.

▲ Lixiviant (Mining Solution) Injection Well

Hydrostatic Heads in a Well Run Uranium *In-Situ* Solution Mining Operation

(Graph not to Scale, does not attempt to account for Natural Aquifer Pressure Gradient Effects)



I: Injection Well
P: Production Well
MW: Monitoring Well
P_o: Initial Res. Press.


FORTUNE

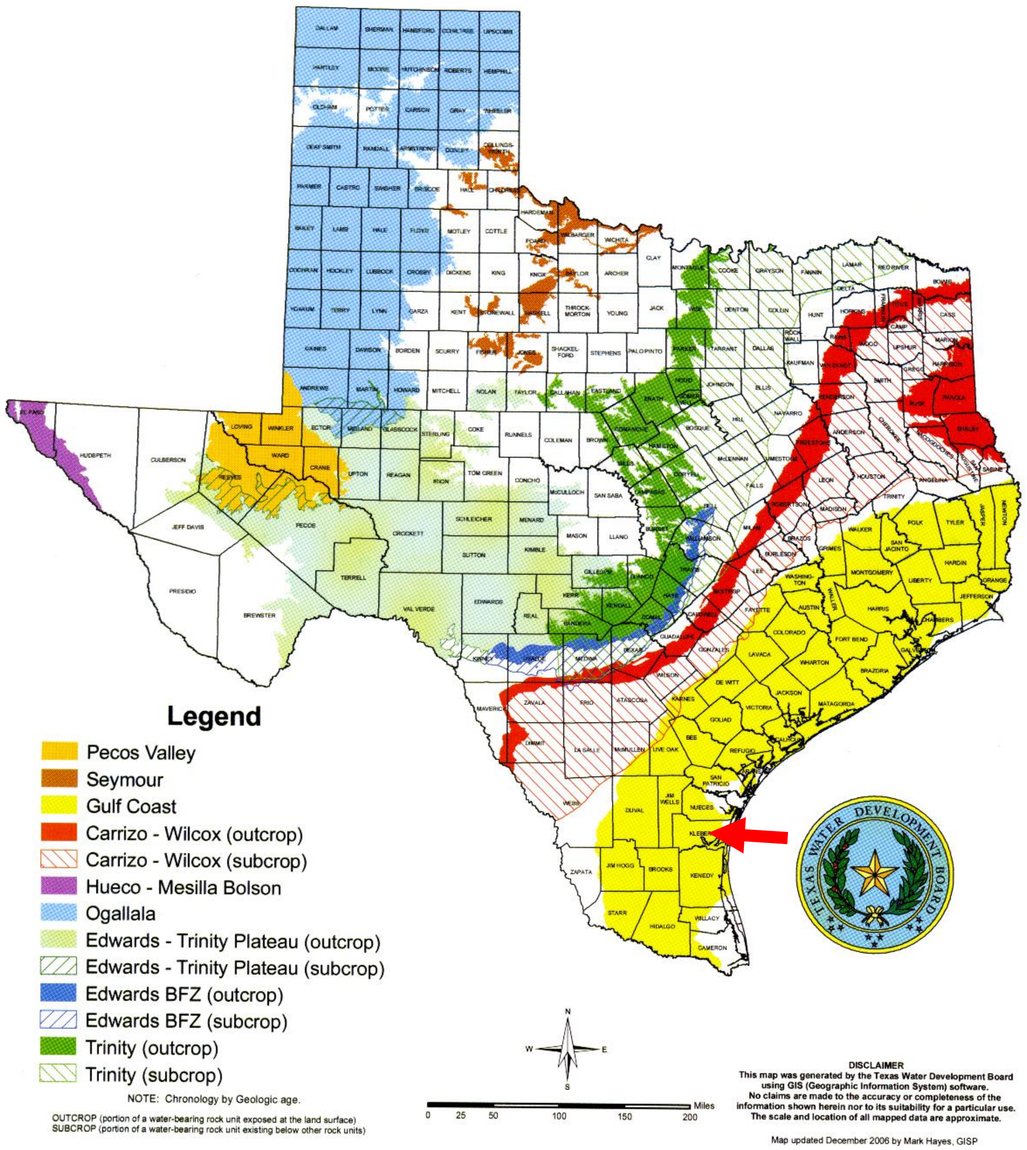
The Garcia Hill Area and Production Area No. 3 (**PA-3**) of the Kingsville Dome (KVD) Mining Site, Kleberg County, TX

The KVD mining site is located just East of the town of Ricardo in Kleberg County, Texas. Uranium in-situ solution mining operations at this site have taken place in the Goliad Aquifer. This aquifer is part of the Evangeline Aquifer, found within the Gulf Coast Aquifer (see Slide 13). Within the potentiometric surface illustrated in Slide 14, cones of depression (red arrows) can be seen, which point to the ground water operations that supply the cities of Victoria, to the North, and Kingsville to the South. The KVD site is located (see Slide 15) within the city of Kingsville cone of depression.

Slide 16 illustrates the site's permitted area and the red arrows point to the location of the drinking water supply wells of most interest to this work: Garcia Hill wells W-20, W-24 and W-25. Slide 17 shows the Garcia family's acreage adjacent to the mining site. Pictures of the above wells' locations can be seen in Slides 18, 19, 20, 21 and 22.

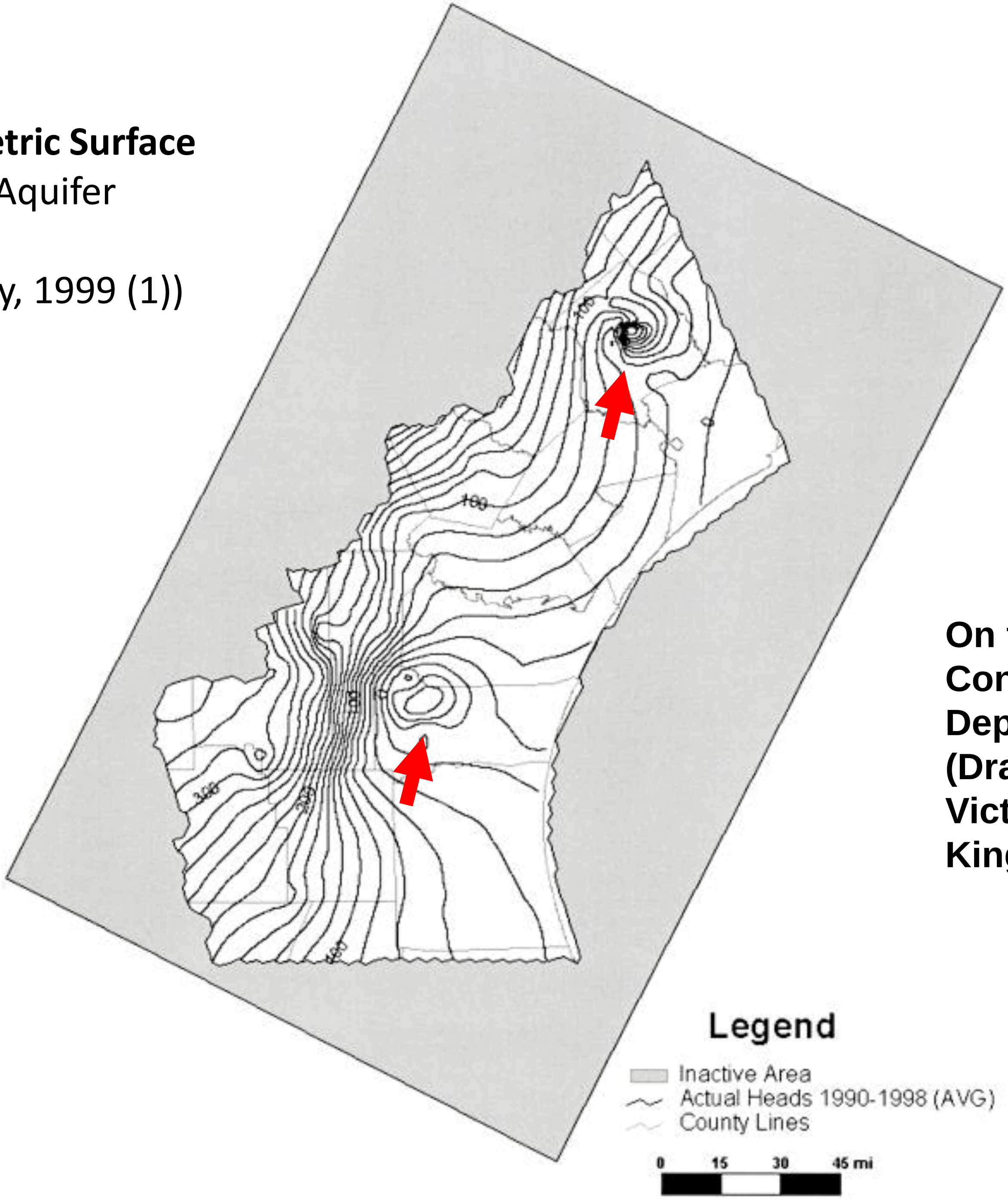
The mining site is operated by Uranium Resources, Inc. (URI).

Major aquifers of Texas.



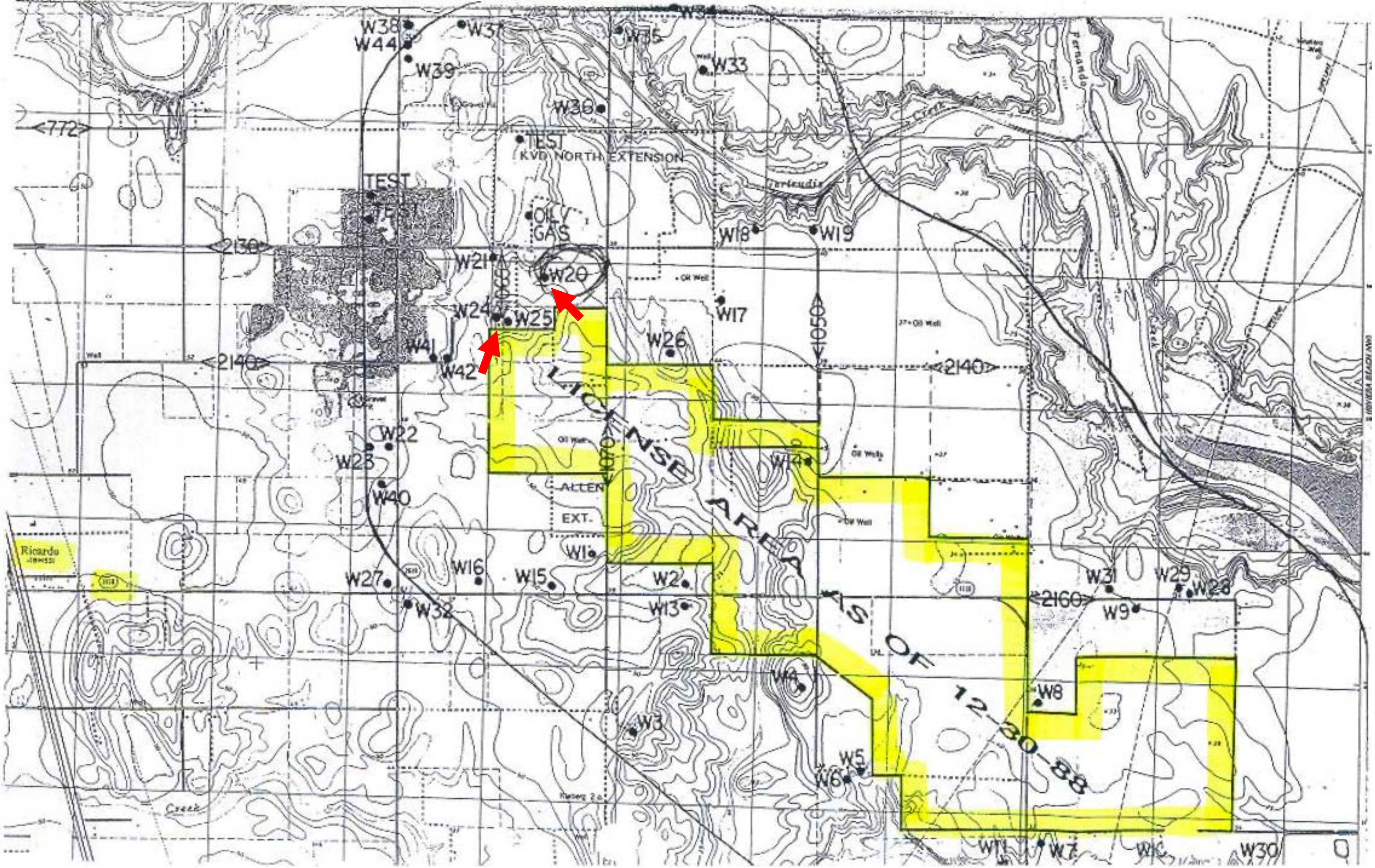
www.twdb.state.tx.us/groundwater

Potentiometric Surface
Evangeline Aquifer
1990
(After R. Hay, 1999 (1))

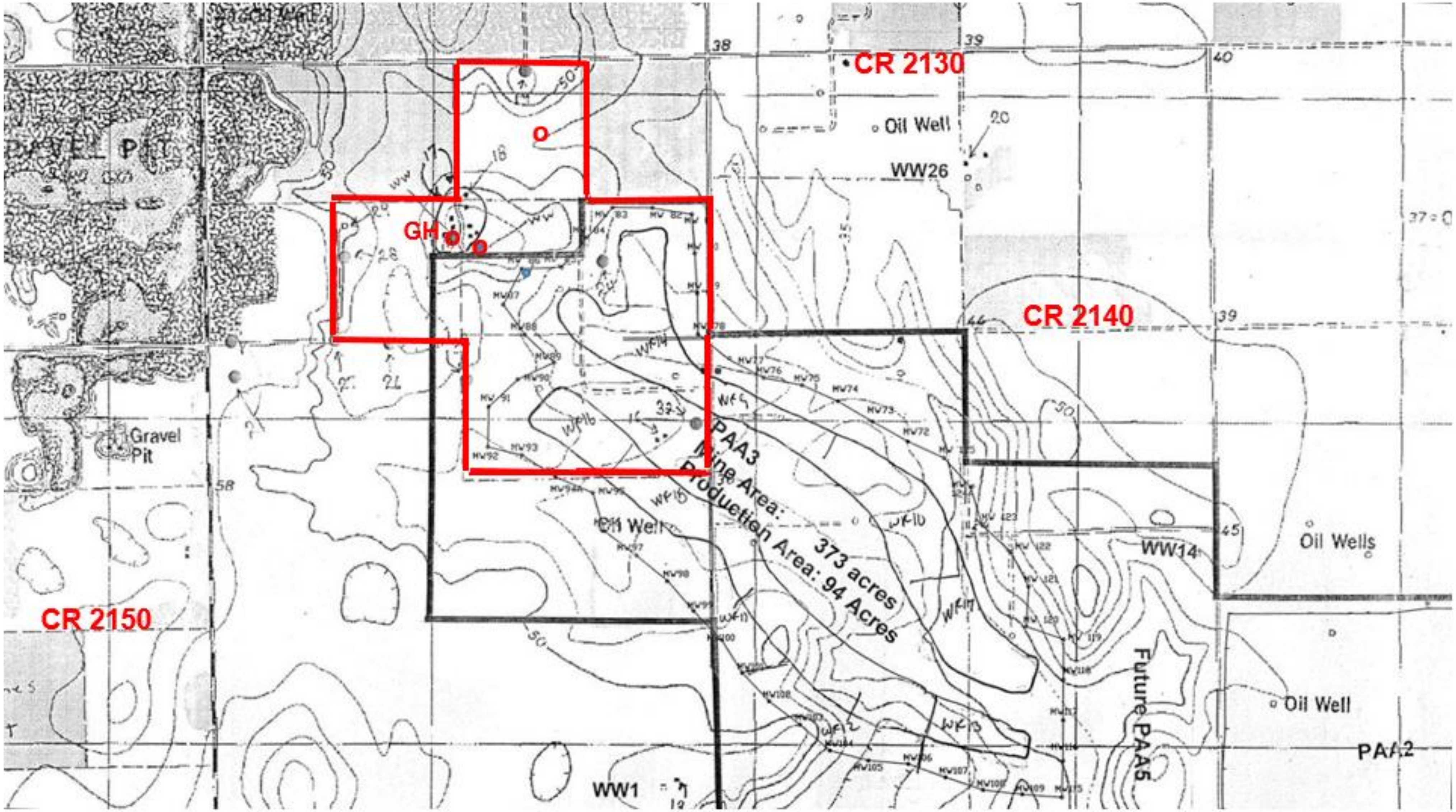


On this Map:
Cones of Press.
Depression
(Drawdown) at
Victoria and
Kingsville

The red arrow points to the approximate location of the Kingsville Dome (KVD) Mining Site



Red arrows point to the location of the Garcia Hill Water Supply wells of interest.



RESIDENCES

1 - Mrs. A. M. Cumberland
2 - Mr. and Mrs. Palerelo
3 - Mr. and Mrs. Fred Radford
4 - Mr. and Mrs. Santiago De La Rosa
5 - Mr. and Mrs. Johnny Robertson
6 - Mr. and Mrs. Bippert
7 - Perez Family
8 - May Family
9 - Mr. and Mrs. Canales
10 - Mr. and Mrs. Harry Anthony
11 - Dr. and Mrs. Perez
12 - Dietz Home
13 - Mrs. W. E. Cumberland
14 - Mr. and Mrs. Gerald Cumberland
15 - Mr. and Mrs. Doyle Dryer
16 - Mr. and Mrs. Candilario Benavente (7 adults and children)
17 - Garcia Hill (19 adults and children)
18 - Mr. and Mrs. Carlos Ortegon
19 - Mr. and Mrs. Baldemar Basaldua
20 - Mrs. O. D. Rosse
21 - Mr. and Mrs. Jaime Garcia (5 adults and children)
22 - Hausler Family
23 - Mr. and Mrs. John Cumberland (adults and children)
24 - Mr. and Mrs. Adrian De La Paz (adults and children)
25 - Ms. Thelma Bustamente (adult and children)
26 - Mr. and Mrs. Reuben Bustamente
27 - Mr. and Mrs. Tomas Garza
28 - Mr. and Mrs. Luis Ortegon
29 - Mr. and Mrs. Fermin Garza (adults and children)
30 - Mr. and Mrs. Sonny Gonzales (adults and children)
31 - Mr. and Mrs. Gary Underbrink
32 - Perez Family (adults and children)
33 - Jesse Jaime

Jointly Prepared Map

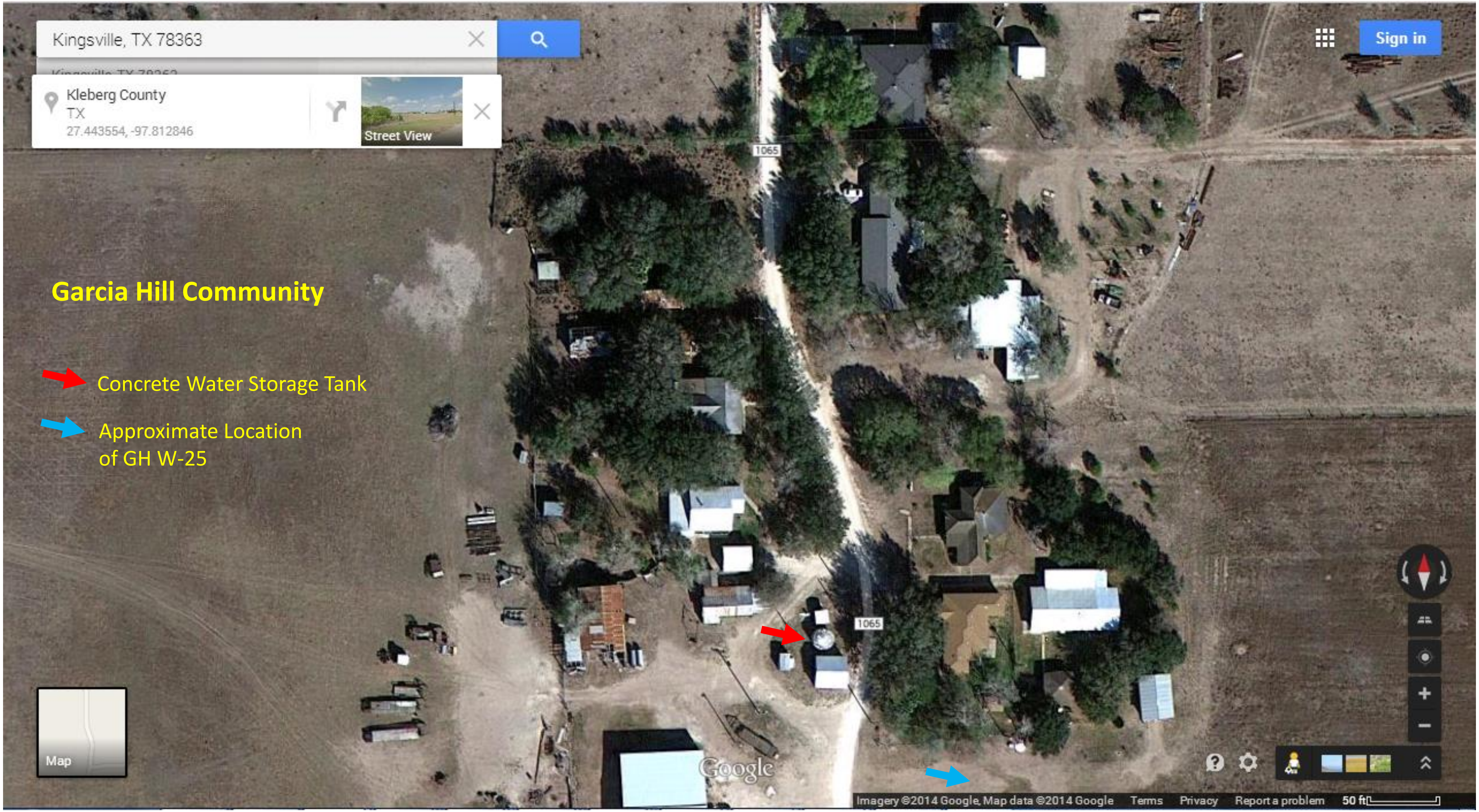
(The numbers near well locations refer to sequential list of residents' names, not well IDs)

(The location of the Garcia Hill water supply wells is marked by the red circles)

Garcia Hill Well W-24 and Ground Water Production Gathering Station
Red arrow points to the location of GH’s original water supply well.

Garcia Hill Well W-25 - 02/11/2002

Garcia Hill W-20’s Wellhead as seen on July 16, 2012



Kingsville, TX 78363
Kleberg County
TX
27.443554, -97.812846
Street View
Sign in
Garcia Hill Community
Concrete Water Storage Tank
Approximate Location
of GH W-25
1065
1065
Map
Google
Imagery ©2014 Google, Map data ©2014 Google
Terms
Privacy
Report a problem
50 ft

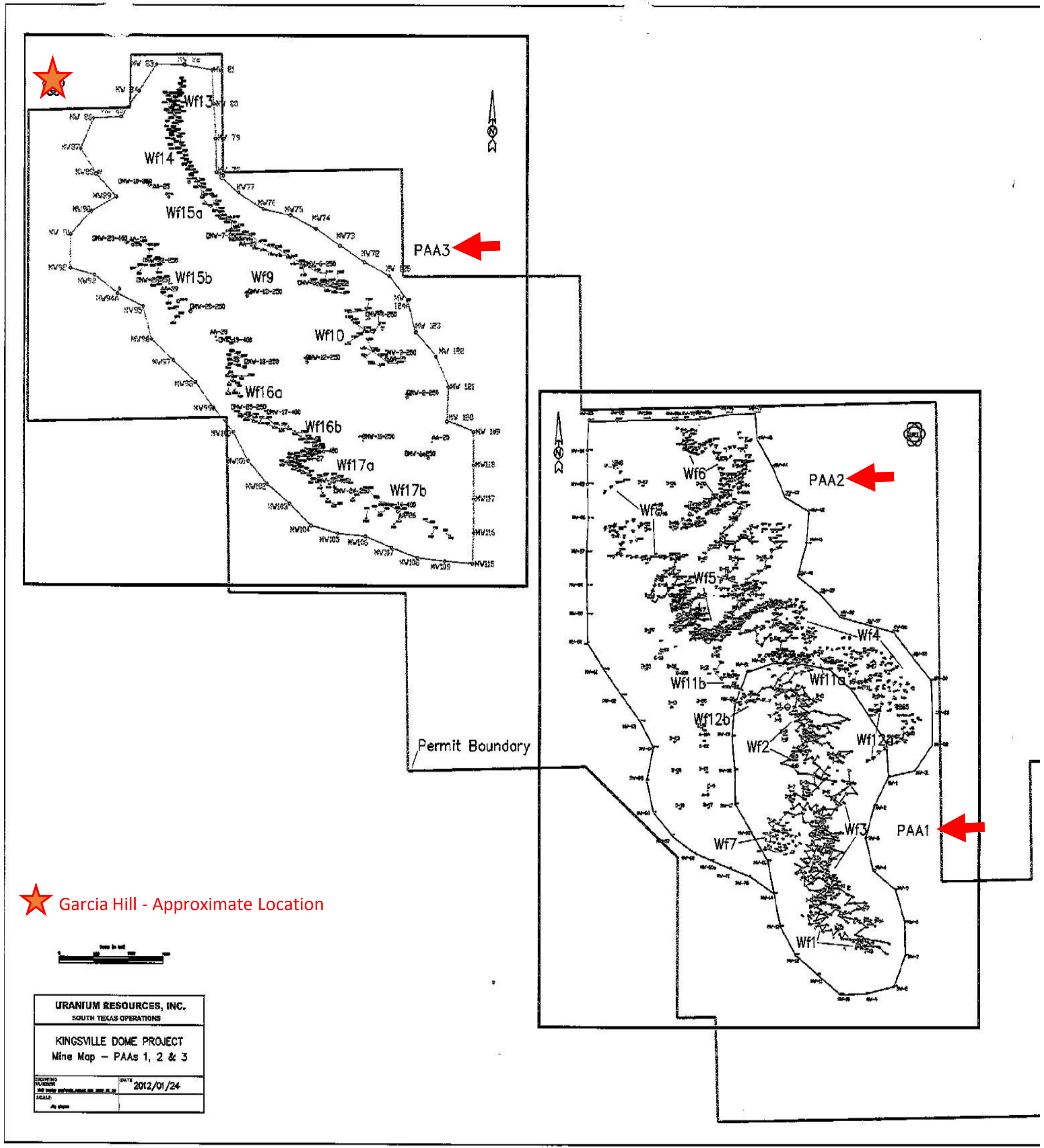

Kingsville, TX
Kleberg County
TX
27.443568, -97.812853
Sign in
Garcia Hill W-20

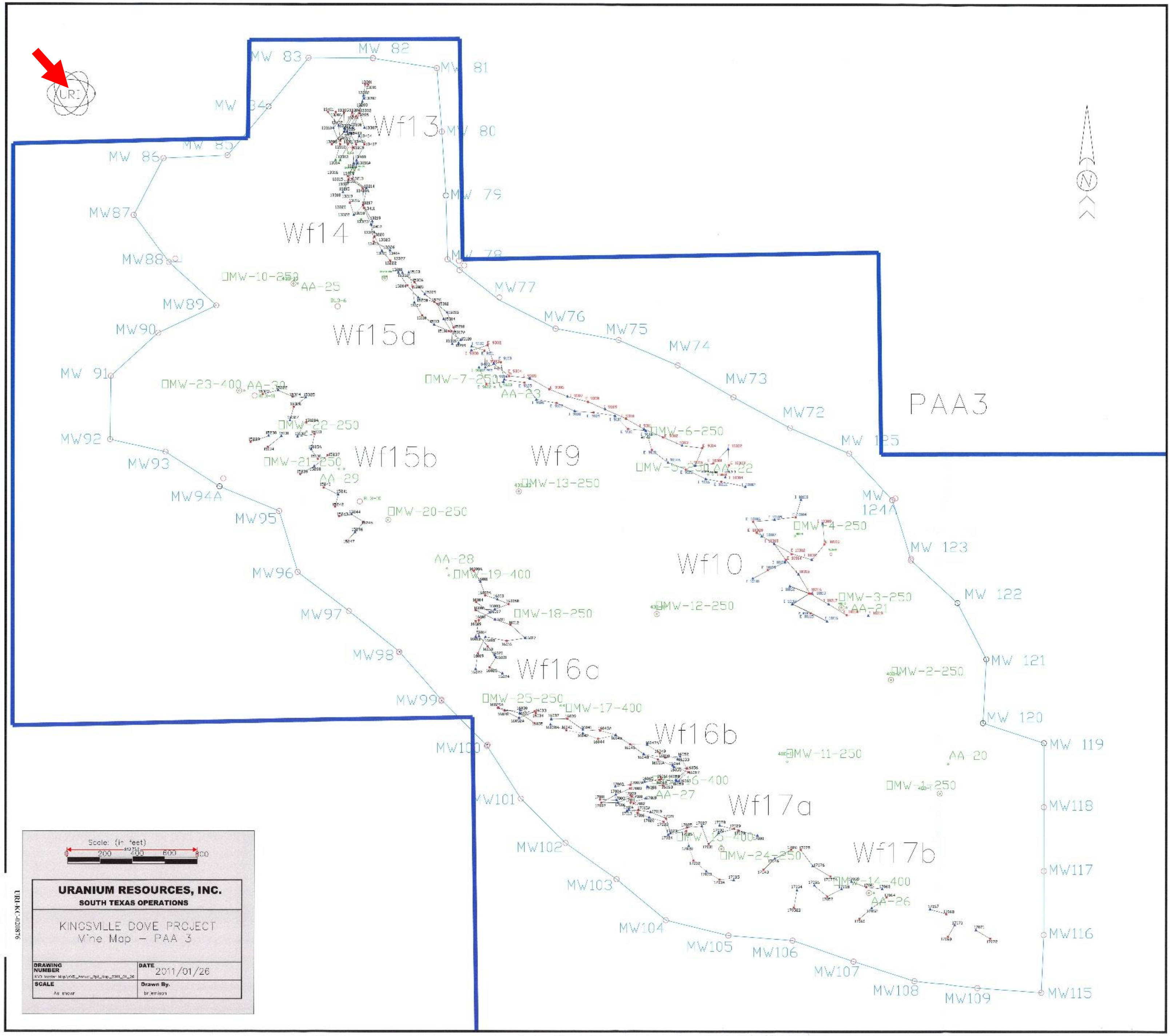
Slide 24 illustrates the location of the Production Areas that make up the KVD mining site. Uranium concentrations in the ground water produced at the Garcia Hill wells W-24 and W-25 have increased above baseline conditions since 1997, North and downgradient of KVD's PA-3. The analysis of field data, following citizens' complaints, brought up suspicions of a possible connection between the mining operations at PA-3 and the observed increased uranium concentrations in the Garcia Hill drinking ground water.

Slide 25, a replica of Slide 8, shows the location of PA-3's Wellfields. The red arrow in Slide 25 points to the approximate location of the Garcia Hill community. Slide 26 illustrates the uranium concentration history in the Garcia Hill ground water provided by the mine operator, URI, in August, 2013. The double headed arrows in Slide 26 show the periods during which mining operations were conducted in the Wellfields illustrated in the map in Slide 25. Slide 27 also illustrates the uranium concentration history of the Garcia Hill ground water, based on data provided by Dr. Richard Abitz on 10/21/12. The schedule of operations detailed in Slides 28 and 29 was used to complete the graph in Slide 26.

The ground water uranium concentrations history seen in Slides 26 and 27 indicates that the first abrupt change in concentrations followed intense exploratory drilling operations in the area. The second abrupt change in uranium concentrations was observed some time after mining operations had taken place in Wellfields 9 and 10. The above information suggests that the impact of subsequent mining operations on the ground water uranium concentrations has not been detected at Garcia Hill as yet. Seven Wellfields were mined after operations were suspended at Wellfields 9 and 10 in PA-3, and another abrupt change could potentially be added to the curve in Slide 26, should Water Quality monitoring be continued through the years at, or near, the GH W-24 well.

Well Fields in Production Areas 1, 2 and 3 at KVD Uranium Mining Site




URI
PAA3
Wf13
Wf14
Wf15a
Wf15b
Wf9
Wf10
Wf16a
Wf16b
Wf17a
Wf17b
N
Scale: (in feet)
0 200 400 600 800
URANIUM RESOURCES, INC.
SOUTH TEXAS OPERATIONS
KINGSVILLE DOVE PROJECT
Mine Map – PAA 3
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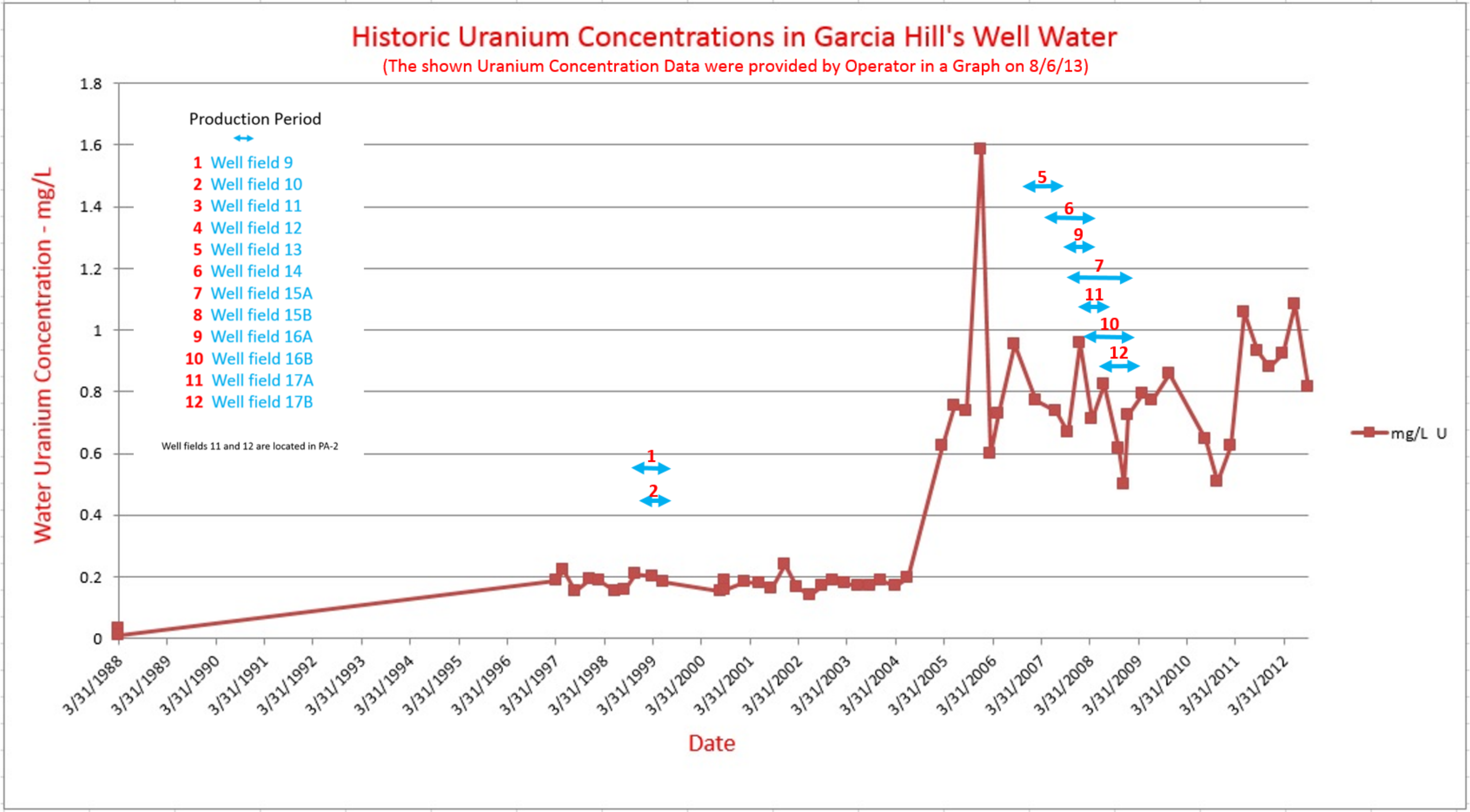
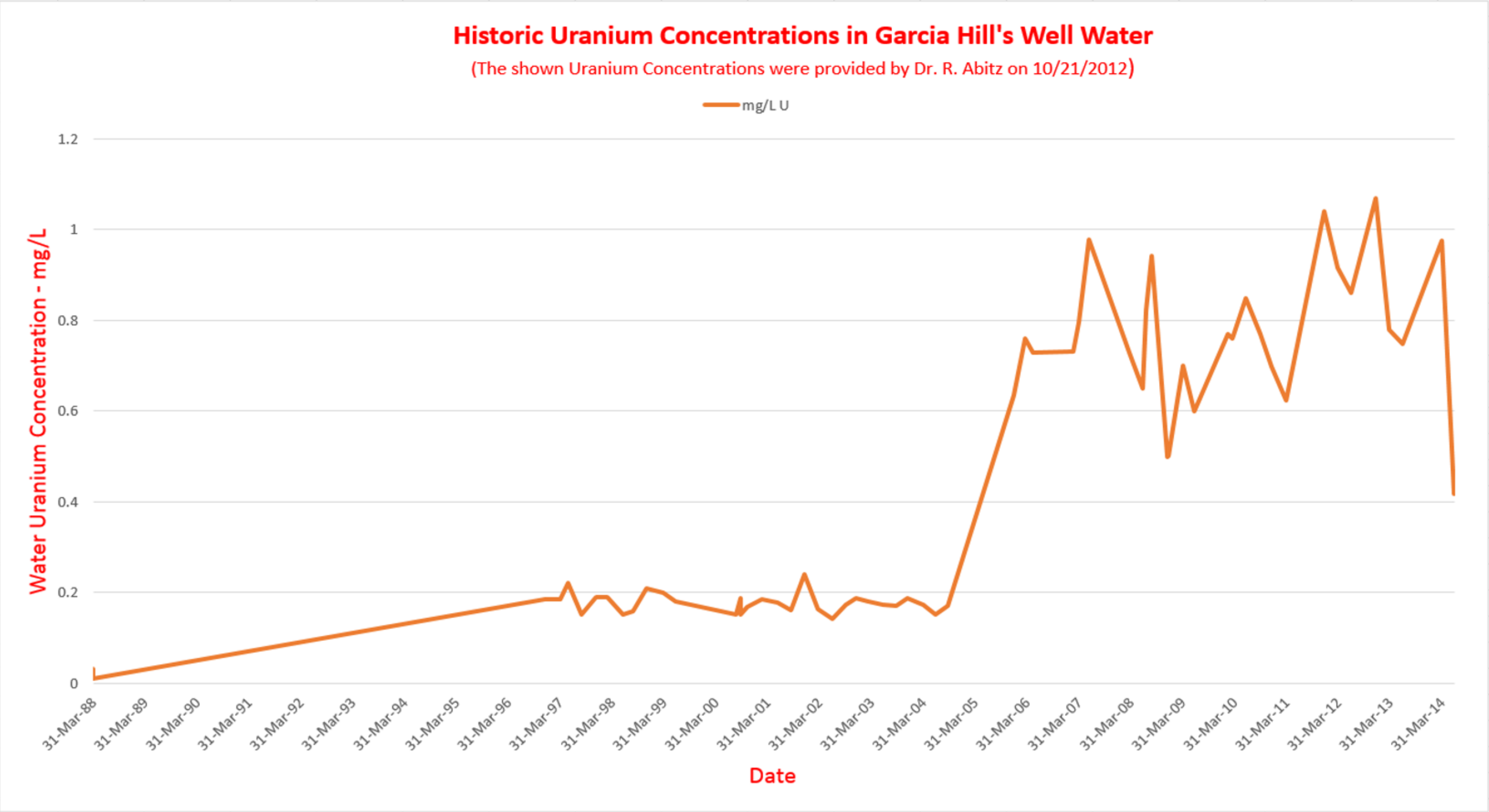
DATE 2011/01/26
SCALE As shown
Drawn By:



Historic Uranium Concentrations in Garcia Hill's Well Water
(The shown Uranium Concentration Data were provided by Operator in a Graph on 8/6/13)
Water Uranium Concentration - mg/L
Production Period
1 Well field 9
2 Well field 10
3 Well field 11
4 Well field 12
5 Well field 13
6 Well field 14
7 Well field 15A
8 Well field 15B
9 Well field 16A
10 Well field 16B
11 Well field 17A
12 Well field 17B
Well fields 11 and 12 are located in PA-2
mg/L U
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
3/31/1988
3/31/1989
3/31/1990
3/31/1991
3/31/1992
3/31/1993
3/31/1994
3/31/1995
3/31/1996
3/31/1997
3/31/1998
3/31/1999
3/31/2000
3/31/2001
3/31/2002
3/31/2003
3/31/2004
3/31/2005
3/31/2006
3/31/2007
3/31/2008
3/31/2009
3/31/2010
3/31/2011
3/31/2012
Date


Historic Uranium Concentrations in Garcia Hill's Well Water
(The shown Uranium Concentrations were provided by Dr. R. Abitz on 10/21/2012)
mg/L U
Water Uranium Concentration - mg/L
1.2
1
0.8
0.6
0.4
0.2
0
31-Mar-88
31-Mar-89
31-Mar-90
31-Mar-91
31-Mar-92
31-Mar-93
31-Mar-94
31-Mar-95
31-Mar-96
31-Mar-97
31-Mar-98
31-Mar-99
31-Mar-00
31-Mar-01
31-Mar-02
31-Mar-03
31-Mar-04
31-Mar-05
31-Mar-06
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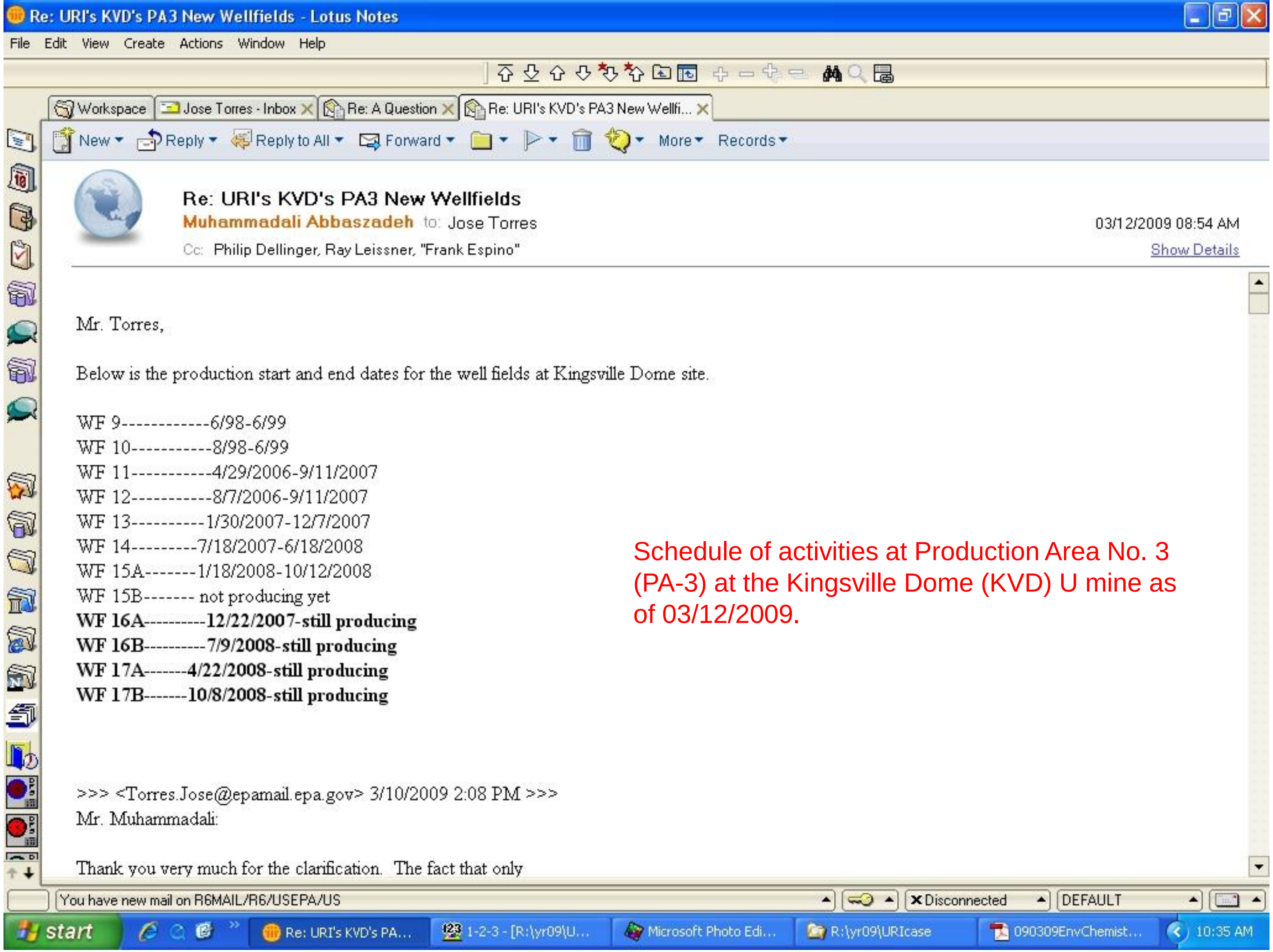
31-Mar-13
31-Mar-14
Date



Re: URI's KVD's PA3 New Wellfields

Muhammadali Abbaszadeh to: Jose Torres — 03/12/2009 08:54 AM

Cc: Philip Dellinger, Ray Leissner, "Frank Espino" — Show Details

Mr. Torres,

Below is the production start and end dates for the well fields at Kingsville Dome site.

WF 9------------6/98-6/99
WF 10-----------8/98-6/99
WF 11-----------4/29/2006-9/11/2007
WF 12-----------8/7/2006-9/11/2007
WF 13----------1/30/2007-12/7/2007
WF 14---------7/18/2007-6/18/2008
WF 15A-------1/18/2008-10/12/2008
WF 15B------- not producing yet
WF 16A---------12/22/2007-still producing
WF 16B---------7/9/2008-still producing
WF 17A-------4/22/2008-still producing
WF 17B-------10/8/2008-still producing

>>> <Torres.Jose@epamail.epa.gov> 3/10/2009 2:08 PM >>>
Mr. Muhammadali:

Thank you very much for the clarification. The fact that only

Schedule of activities at Production Area No. 3 (PA-3) at the Kingsville Dome (KVD) U mine as of 03/12/2009.

Production Schedule for KVD's Well Fields

1	Well field 9	06/09/1998 - 04/02/1999
2	Well field 10	07/29/1998 - 04/02/1999
3	Well field 11	04/07/2006 - 09/11/2007
4	Well field 12	08/07/2006 - 09/11/2007
5	Well field 13	02/12/2007 - 12/07/2007
6	Well field 14	07/19/2007 - 06/19/2008
7	Well field 15A	01/18/2008 - 06/17/2009
8	Well field 15B	No Mining Yet
9	Well field 16A	12/22/2007 - 07/09/2008
10	Well field 16B	07/10/2008 - 06/17/2009
11	Well field 17A	04/22/2008 - 10/07/2008
12	Well field 17B	10/08/2008 - 06/17/2009

Slide 31 provides a summary of inter-well distances, developed as a guide for the selection of wells for which Gamma Ray Logs, water quality data and other information pertinent to this data review might be available. The group of wells for which Gamma Ray Logs were analyzed in the course of this data review are highlighted by the arrows in the map in Slide 32.

Slide 33 confirms the location of the Production Areas and Wellfields seen in Slide 24 within the cone of depression created in the Goliad Aquifer by the city of Kingsville's ground water supply system. It can be seen in this slide that the overall effects of a disturbance (a pressure drawdown due to water production in this case) introduced into the aquifer has an impact in all directions around the point of water production. In other words, these data show that a radial flow pattern is approached when water supply wells, completed in the Goliad Aquifer in this area, go on production.

The cross section seen in Slide 34 illustrates the formations of interest in this data review. Sands A and B are the uranium producing zones in PA-3.

Estimated distances between Garcia Hill Wells and Key Locations at North end of PA-3

Well	Ft	Well
W-25	582.7	MW-86
W-24	749.8	MW-86
W-25	653.3	MW-87
W-24	857.9	MW-87
W-25	1562.4	W-20
W-24	1476.6	W-20
W-25	394.0	2699
W-24	555.1	2699
W-25	512.8	2657
W-24	685.8	2657
W-25	701.7	2664
W-24	661.1	2664
W-25	1830.6	2708
W-24	1955.4	2708

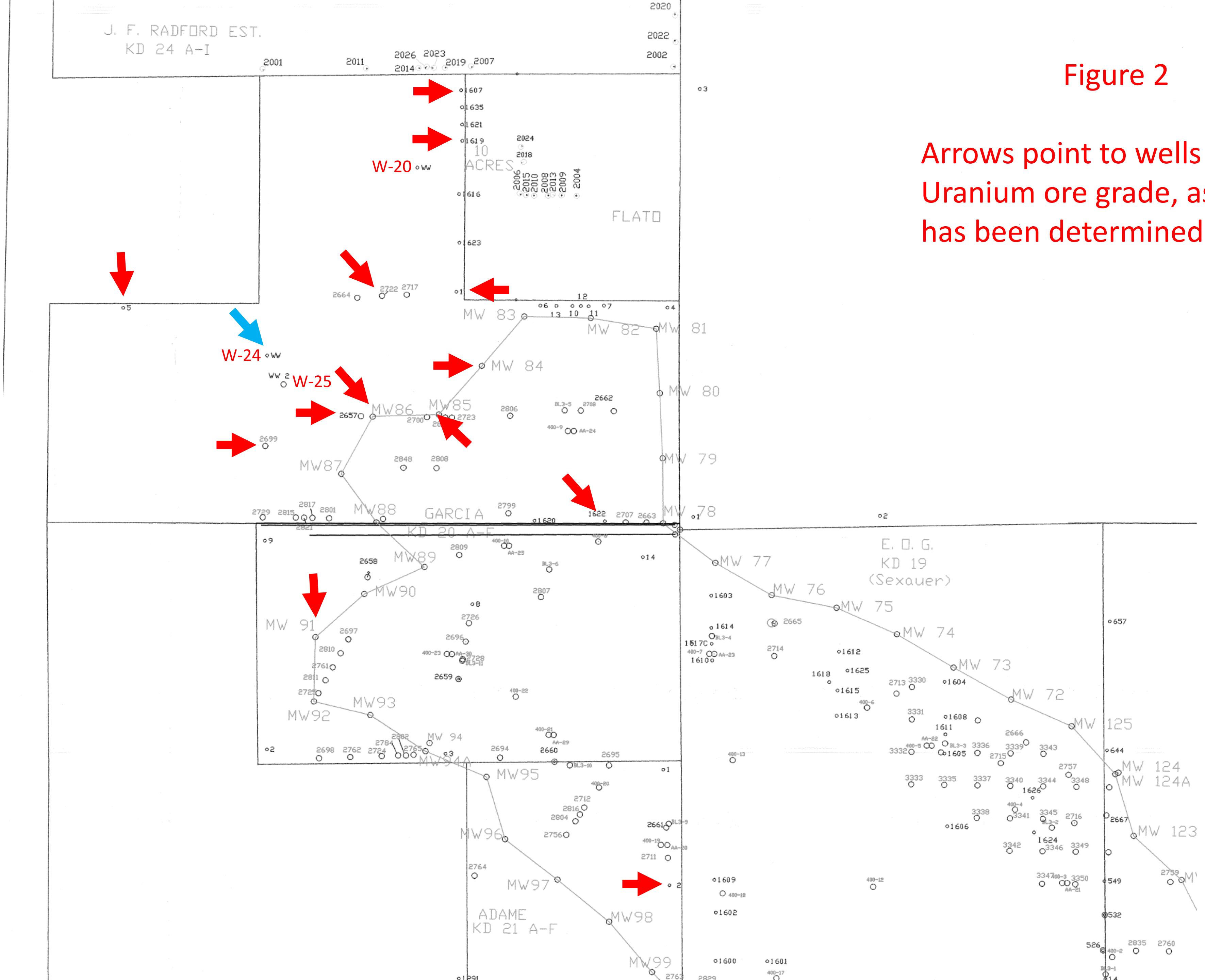
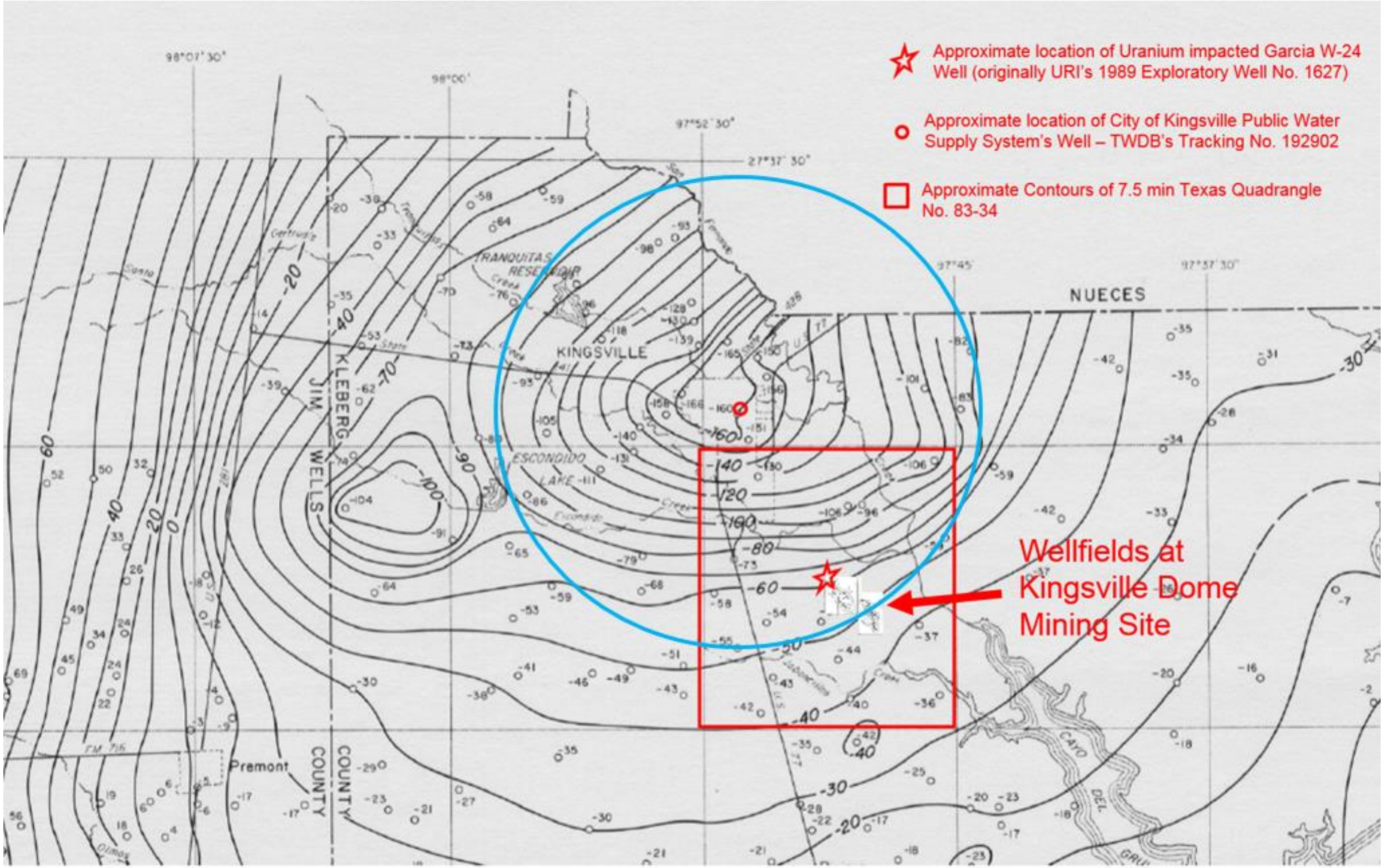
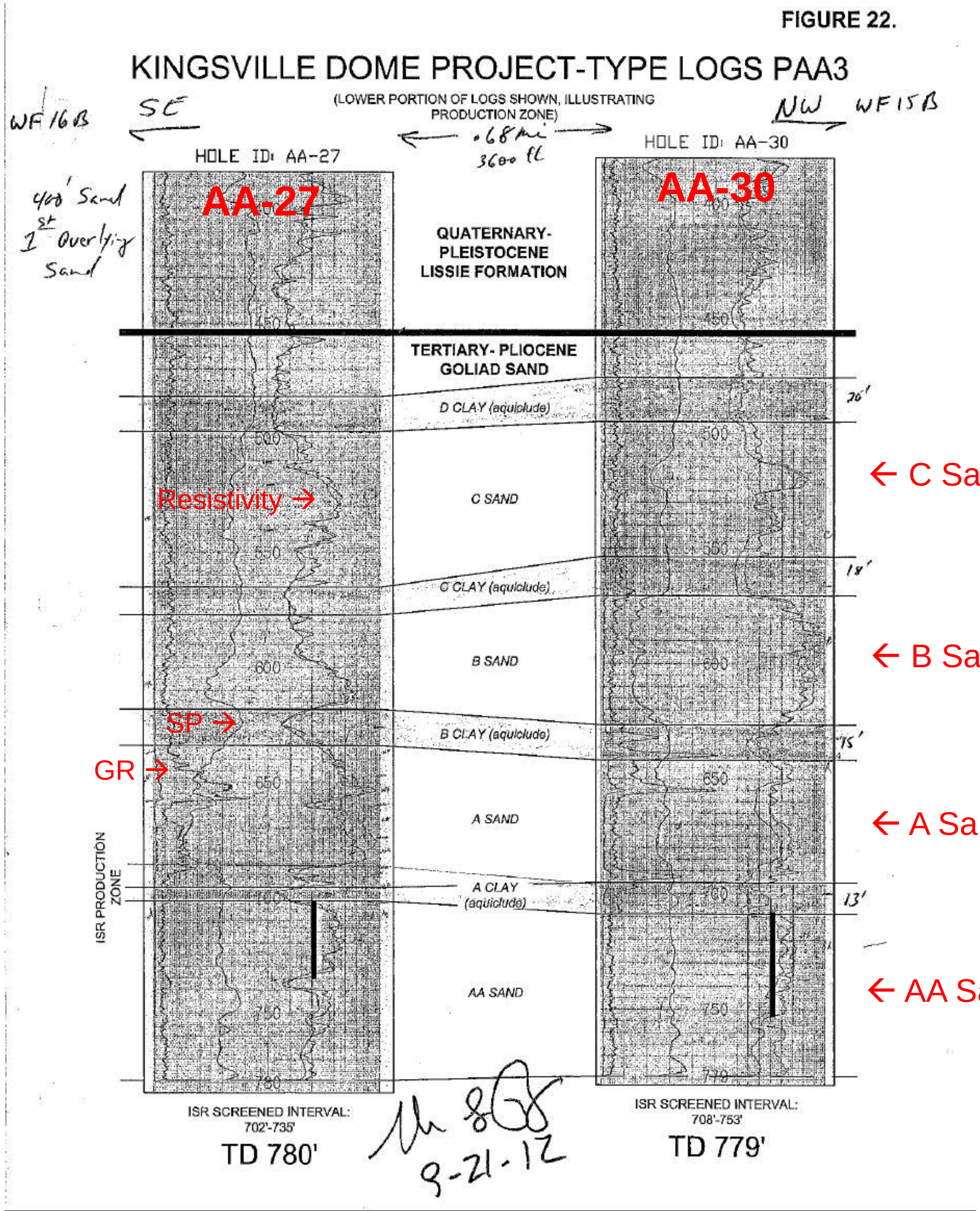


Figure 2

Arrows point to wells for which Uranium ore grade, as %U3O8, has been determined.



Approximate Potentiometric Surface, Goliad Aquifer, Kingsville Area, 1968-69 – TWDB Report 173 – 1973



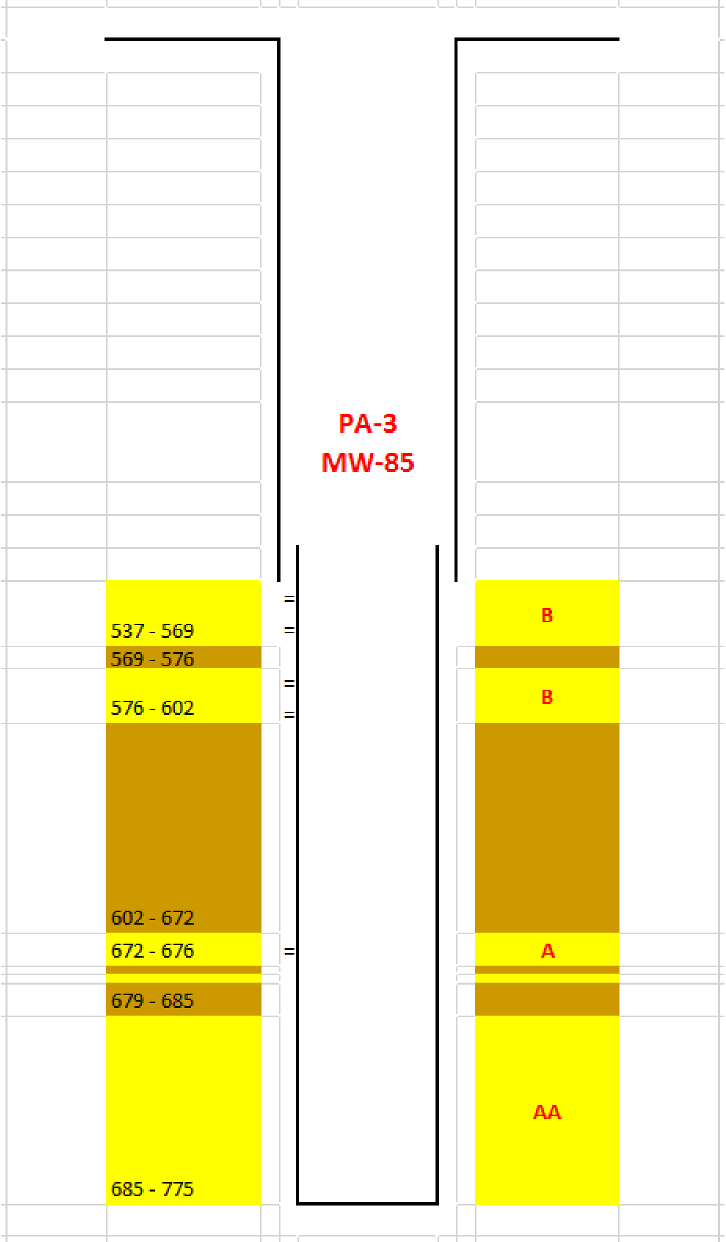
← C Sand:

← B Sand:

← A Sand:

← AA Sand:

Operator's Zones ID:



The Goliad Aquifer’s **Baseline Water Quality** in the Garcia Hill Area Part I

The baseline Water Quality conditions for the Garcia Hill community's ground water has been established on the basis of lab determination of Natural Uranium concentrations in mg/L. However, as can be seen in Slide 37, at times concentrations are given either in mg/L U3O8 equivalent, or in µCi/mL. Slides 38 and 39 illustrate how those reported results have been converted here to (mg Natural Uranium/L) for the purpose of this data review, and so that valid Water Quality comparisons can be made.

Slide 40 shows the current status of the first known Garcia Hill water supply well. The 1988 water sample, whose Lab results are illustrated in Slide 41, was collected at this well. This Lab report, along with the one seen in Slide 42, is part of the data set that has played an important role in establishing the baseline Water Quality conditions in the Goliad Aquifer in the Garcia Hill area.

The well seen in Slide 40 was plugged and abandoned (P&A'd) when URI converted its exploratory well 1627 to a water supply well (the GH W-24 well) in 1989. The Lab results seen in Slides 41 and 42 are plotted as the initial points in the graph in Slide 43, and are considered representative of the baseline Water Quality conditions at Garcia Hill, a determination validated through the analysis of a substantial amount of engineering data, as shown below.

The bar graph seen in Slide 44 depicts the Water Quality analysis results for a set of PA-3 Monitoring Wells located along the North border of the Monitoring Well Ring, all in the vicinity of the Garcia Hill area. The lab results for seven of these wells, documented in the operator provided map seen in Slide 45 and illustrated in Slide 46, stand below, or near, EPA's Uranium MCL of 32 µg/L.

Slide 47 illustrates the lab results for a Goliad Aquifer sample from a city of Kingsville Public Water Supply Well gathered on 9/12/2012. The reported Uranium concentration of 8.0 µg/L falls within the range of those observed in the Garcia Hill area before the aquifer was disturbed. The city of Kingsville facility where the sample was obtained, "EP004", is seen in Slide 48.

Exhibit B Kingsville Dome

5/21/87	pH	Conduct	U_3O_8	$NaHCO_3$	SO_4	Cl^-
arole Bries # 19	7.51	1991	0.12	432	248	
Huff # 79	7.83	2160	0.00	334	447	
5/22/87						
Garcia # 69A	7.74	1580	0.05	432	210	
Garcia # 69B	7.86	1500	0.08	460	184	
D. Rosse # 72	8.69	1590	0.00	Na_2CO_3 35 376	187	
Collins # 73	7.89	1420	0.10	488	104	
J. Larfin # 74	7.83	2430	0.07	279	545	
5/26/87						
Garcia # 69C	7.97	1600	0.05	446	209	
Cumberland # 76	7.84	1540	0.10	432	210	239
Cumberland # 77	7.84	1470	0.07	474	156	246
Williams # 144	7.91	1800	0.00	460	179	
C. E. May # 150	7.97	1730	0.08	418	241	
A. Salnzar # 151	7.56	1710	0.03	446	244	
May # 152	7.92	1760	0.05	460	184	
adford Windmill	8.65	1630	0.00	362	35*	

* Approximate Value

RECEIVED JUN - 2 1997

RECEIVED SOURCE WATER PROTECTION BRANCH 05 OCT 19 AM 8:11

Prot. 10

LO 3653

Form CRE-UR
Rev. 09/01/96

RADIONUCLIDE SAMPLE AND ANALYSIS REPORT

TEXAS DEPARTMENT OF HEALTH
1100 W. 49th STREET
AUSTIN, TEXAS 78756

Lab No. [redacted]
Date Received SEP 2 2 2000

Bureau of Radiation Control

Urgent Processing Authorized By:

Routine ● Urgent ○

Licensee/Facility Name:

License No: 3653

Site No: ______ No. of Samples: 2 of 2

Station/Well No: ______

Sample Description: residential well

Sample Code:

Reason for Sampling: ~~PGO Well~~ customer request

Sample Location: Garcia Well

Bill to: BRC

Sample Collection Date: 9-22-00 Time: 8am

Sample Collector Name: Robin Cooksey

Radiation Survey of Sample: bkg mR/hr ○ uR/hr ○ cpm ○

Notes: ______

The following certify, by their signature(s), that they were continuously in control of this sample until transferred to the next indicated person:

Transfer from	To	Date	Time
RC	Sharon Farris	9-22-00	2 PM
Farris	TDH Lab	9/22/00	1500

Condition of Seals: ☑ Satisfactory ○ Unsatisfactory ______

Wet Weight: ______

Ash Weight: ______ Dry Weight: ______

Notes: ______

I certify that this sample was continuously in my custody from the time and date of receipt listed hereon until the completion of laboratory analysis.

Signature: Virginia Kammerdiener 10/30/00

Date: Reported NOV 13 2000 ~~Analyzed~~ ______

Copies:
● License file ○ Facility file
○ Incident/complaint file
● Collector
● Other: Mr Saenz

148 East CR 2130

NOV 14 2000

Bureau of Laboratories

● Chemical Analysis Also Performed

Suspected Radionuclides:

URANIUM, RADIUM

Check the required analyses:

Radionuclide	Analyses	Units
○ Gamma Scan:		uCi/

Alpha Analysis:

Gross Alpha		uCi/
● Total Radium	$8 \times 10^{-10} \pm 3 \times 10^{-10}$	uCi/ml
● Total Uranium	$1.02 \times 10^{-7} \pm 3 \times 10^{-9}$	uCi/ml

Beta Analysis:

○ Gross Beta		uCi/
○ Tritium		uCi/
○ Carbon-14		uCi/

○ **Alpha Spectroscopy:**

U-234	$4.8 \times 10^{-8} \pm 2 \times 10^{-9}$	uCi/ml
U-238	$5.3 \times 10^{-8} \pm 2 \times 10^{-9}$	uCi/ml
		uCi/
		uCi/

○ Regulatory limits WERE exceeded.
○ Regulatory limits WERE NOT exceeded.
Signature: ______
Date: ______

Disposal:
○ Rad Waste ○ Non-Radioactive
● To Licensee ○ Decay TRASH
○ Other ______

00015

Converting a Concentration Given as (mg U_3O_8/L) into (mg Natural U/L) Equivalent

(Natural Uranium has been assumed to consist of 100% U_{238} in the shown example)

$$0.05\ \frac{\text{mg}\ \cancel{U_3O_8}}{\text{L}} * \left\{ \frac{1\ \text{mol}\ \cancel{U_3O_8}}{842{,}000\ \text{mg}\ \cancel{U_3O_8}} * \frac{3\ \cancel{\text{mol}\ U_{238}}}{1\ \cancel{\text{mol}\ U_3O_8}} * \frac{238{,}000\ \text{mg}\ U_{238}}{1\ \cancel{\text{mol}\ U_{238}}} \right\} = 0.042\ \frac{\text{mg}\ U_{238}}{\text{L}}$$

Converting Alpha Spectroscopy Results Reported in µCi/mL to (mg Natural Uranium/L)

Radionuclide:	**U-238**		**U-235**		**U-234**		**Natural U**	
Atomic Mass:	238.0289		235.0439299		234.040952			
Half-Life (Yrs):	4.47E+09		7.038E+08		2.46E+05			
Half-Life (Seconds):	1.41E+17		2.22E+16		7.74E+12			
Isotopic Abundance:	0.992746		0.0072		0.000054		1.000000	
Specific Activity (Conversion Factor):	1.24E+04	dps/g	8.00E+04	dps/g	2.30E+08	dps/g		
	3.361E-07	Ci/g	2.162E-06	Ci/g	6.224E-03	Ci/g	6.853E-07	Ci/g
	3.361E-10	Ci/mg	2.162E-09	Ci/mg	6.224E-06	Ci/mg	6.853E-10	Ci/mg
	3.361E-04	µCi/mg	2.162E-03	µCi/mg	6.224E+00	µCi/mg	6.853E-04	µCi/mg
	3.361E+02	pCi/mg	2.162E+03	pCi/mg	6.224E+06	pCi/mg	6.853E+02	pCi/mg
ALPHA SPECTROSCOPY RESULTS for **Garcia Hill Concrete Tank Sample of 12/20/2012**:								
Radionuclide:	**U-238**		**U-235**		**U-234**		**Natural U**	
Reported Concentration (µCi/mL):	2.40E-09	µCi/mL	1.80E-10	µCi/mL	5.20E-09	µCi/mL		
	2.40E-06	µCi/L	1.80E-07	µCi/L	5.20E-06	µCi/L		
Converted Concentration (mg/L)	**0.007**	mg/L	**0.000083**	mg/L	**0.000001**	mg/L	**0.007**	mg/L
Converted Concentration (µg/L)	**7.1**	µg/L	**8.33E-02**	µg/L	**8.35E-04**	µg/L	**7.2**	µg/L

Top view of the irregular concrete slab marking the location of the original GH W-24. The well had a TD of "700 to 800 Ft", per the Garcia family. It was P&A'd in 1989 at the time URI drilled and converted the replacement W-24.

Re: Exploratory drilling took place at KVD between 01/07/96 – 06/05/97

"A total of 1046 exploratory wells were drilled prior to 02/28/1997", per citizen's account.

Lab Report for Garcia Hill Well prior to Above Exploratory Drilling

TEL. 512-884-0371 PO BOX 2552 78403

JORDAN LABORATORIES, INC.
CHEMISTS AND ENGINEERS
CORPUS CHRISTI, TEXAS
MAY 12, 1988

URI, INC.
12377 MERIT DR., SUITE 750, LB14
DALLAS, TEXAS 75251

REPORT OF ANALYSIS

IDENTIFICATION: A. GARCIA
3-31-88 03/31/88

		ANALYSIS DATE
PH	8.19	4-04-88
SPECIFIC CONDUCTANCE	1640 UMHOS/CM @ 25 DEG.C.	4-27-88
	MG/L	
TOTAL DISSOLVED SOLIDS (180 DEG.C.)	974	4-11-88
ARSENIC	0.003	4-08-88
COPPER	<0.01	5-03-88
MOLYBDENUM	0.01	5-03-88
SELENIUM	0.003	4-08-88
URANIUM (NATURAL)	0.011	4-18-88 ← Below MCL
GROSS ALPHA ACTIVITY, PCI/L	9.2 +/- 11	4-27-88
GROSS BETA ACTIVITY, PCI/L	6.3 +/- 6.2	4-27-88
RADIUM 226, PCI/L	1.1 +/- 0.2	4-13-88
THORIUM 230, PCI/L	-0.4 +/- 0.7	5-12-88

LAB. NO. M26-2219

Natural Uranium Concentration
this sample: 0.011 mg/L

RESPECTFULLY SUBMITTED,

Carl F. Crownover

CARL F. CROWNOVER

TEL. 512-884-0371 PO BOX 2552 78403

JORDAN LABORATORIES, INC.
CHEMISTS AND ENGINEERS
CORPUS CHRISTI, TEXAS
MAY 12, 1988

URI, INC.
12377 MERIT DR., SUITE 750, LB14
DALLAS, TEXAS 75251

REPORT OF ANALYSIS

IDENTIFICATION: Y.C. GARCIA
3-31-88

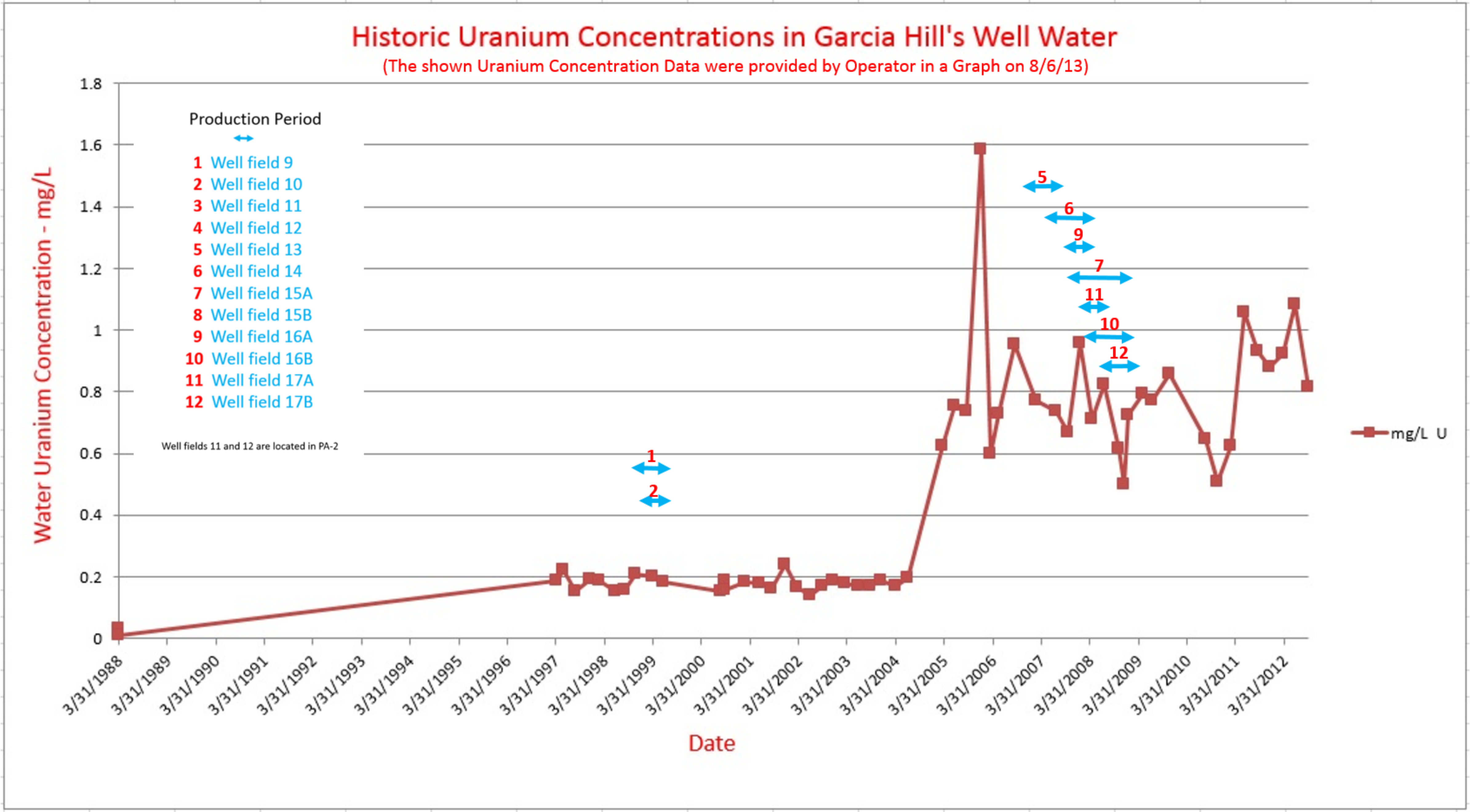
				ANALYSIS DATE
PH ----------------------------	8.24			4-04-88
SPECIFIC CONDUCTANCE 1550 UMHOS/CM @ 25 DEG.C.				4-27-88
			MG/L	
TOTAL DISSOLVED SOLIDS (180 DEG.C.) -------------			858	4-11-88
ARSENIC ---			<0.001	4-08-88
COPPER --			<0.01	5-03-88
MOLYBDENUM --			0.08	5-03-88
SELENIUM --			0.010	4-08-88
URANIUM (NATURAL) ---------------------------------			0.032	4-18-88
GROSS ALPHA ACTIVITY, PCI/L -------	22	+/- 13		4-27-88
GROSS BETA ACTIVITY, PCI/L --------	21	+/- 7		4-27-88
RADIUM 226, PCI/L -----------------	3.2	+/- 0.2		4-13-88
THORIUM 230, PCI/L ----------------	0.6	+/- 0.9		5-12-88

LAB. NO. M26-2220

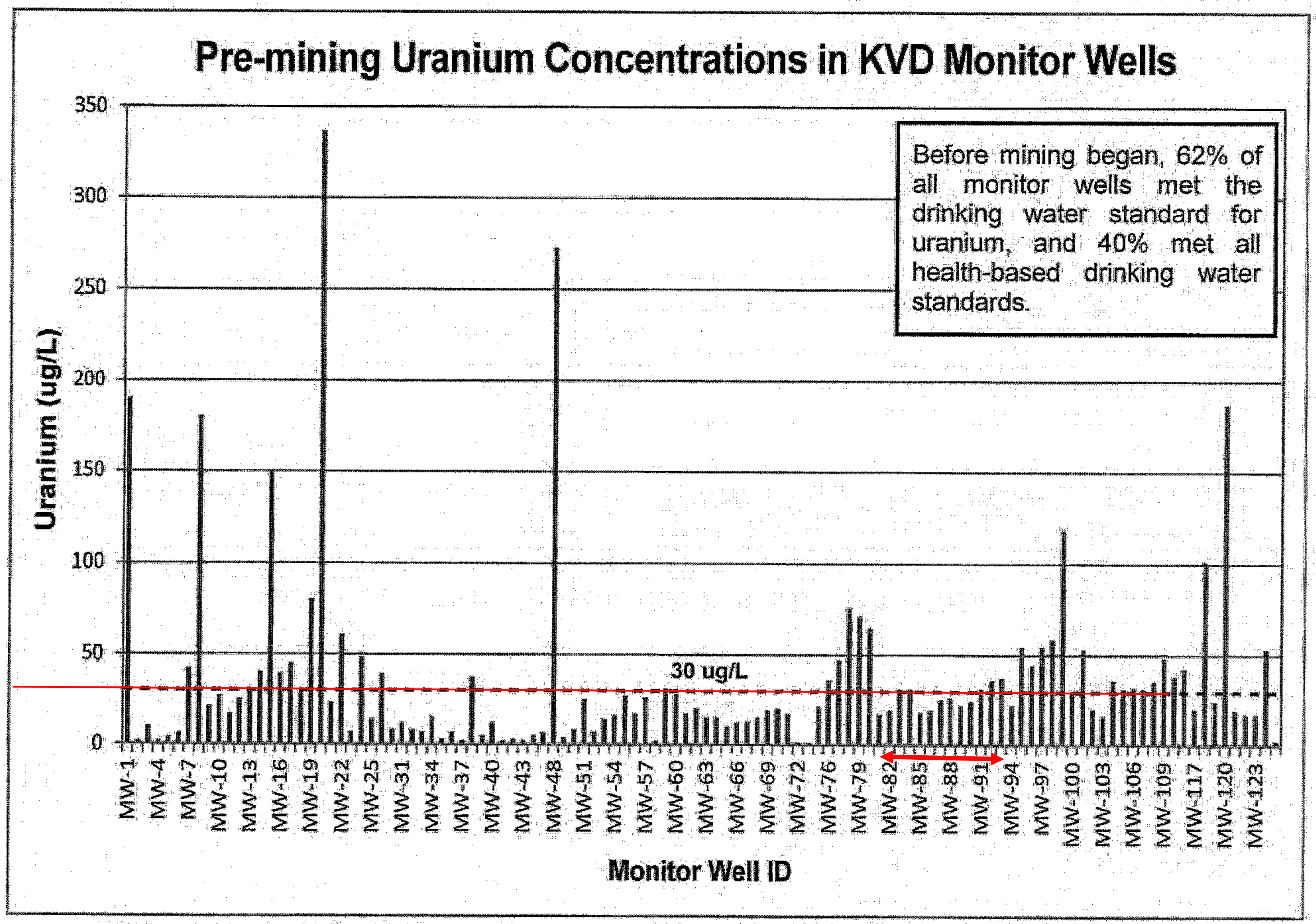
RESPECTFULLY SUBMITTED,

Carl Crownover

CARL F. CROWNOVER


Historic Uranium Concentrations in Garcia Hill's Well Water
(The shown Uranium Concentration Data were provided by Operator in a Graph on 8/6/13)
Production Period
1 Well field 9
2 Well field 10
3 Well field 11
4 Well field 12
5 Well field 13
6 Well field 14
7 Well field 15A
8 Well field 15B
9 Well field 16A
10 Well field 16B
11 Well field 17A
12 Well field 17B
Well fields 11 and 12 are located in PA-2
Water Uranium Concentration - mg/L
Date
mg/L U
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
3/31/1988
3/31/1989
3/31/1990
3/31/1991
3/31/1992
3/31/1993
3/31/1994
3/31/1995
3/31/1996
3/31/1997
3/31/1998
3/31/1999
3/31/2000
3/31/2001
3/31/2002
3/31/2003
3/31/2004
3/31/2005
3/31/2006
3/31/2007
3/31/2008
3/31/2009
3/31/2010
3/31/2011
3/31/2012

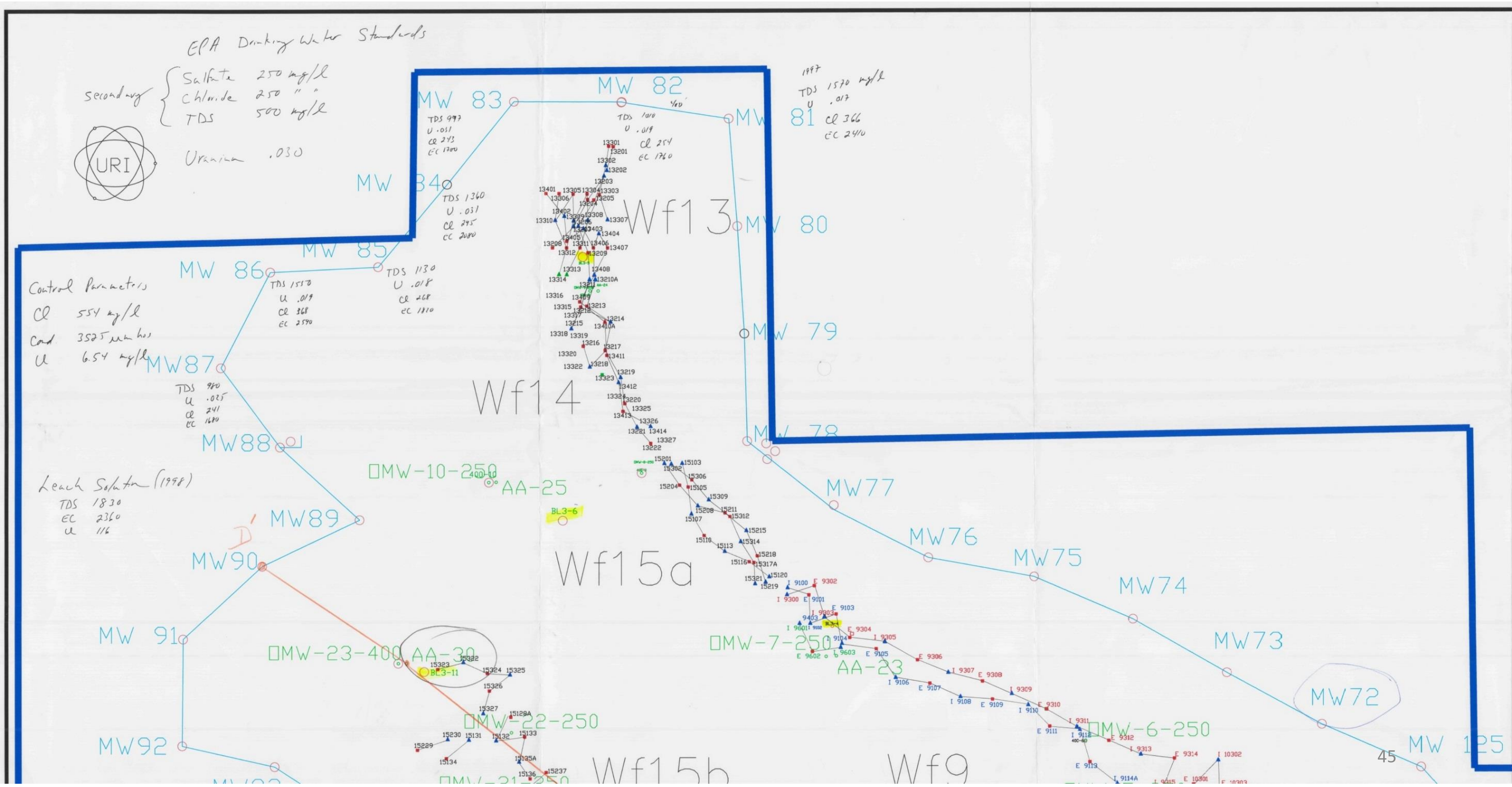
Uranium concentrations in water samples from the North Monitoring Wells (the closest to Garcia Hill and to this work's selected wells) stood at near or below the standard of 30 μg/L.



Data sources: Applications for PAAs 1, 2, and 3, produced by URI in 1987, 1989, and 1997/2002, respectively.

Monitoring Wells MW-81 through MW-93, located near GH, show water Uranium content **at or below MCL.**

Handwritten PA-3 Water Uranium Concentrations for North Monitoring Wells, Near Garcia Hill



Pre-Mining Uranium Concentrations in PA-3's Northernmost Monitoring Wells

Monitoring Well Number	Baseline Uranium Concentration mg/L
MW-81	0.017
MW-82	0.019
MW-83	0.031
MW-84	0.031
MW-85	0.018
MW-86	0.019
MW-87	0.025

Source: Handwritten notes on Operator provided map

One Rare Analysis for Uranium for a City of Kingsville's Public Water Supply Well

TCEQ

Safe Drinking Water Information System (SDWIS)

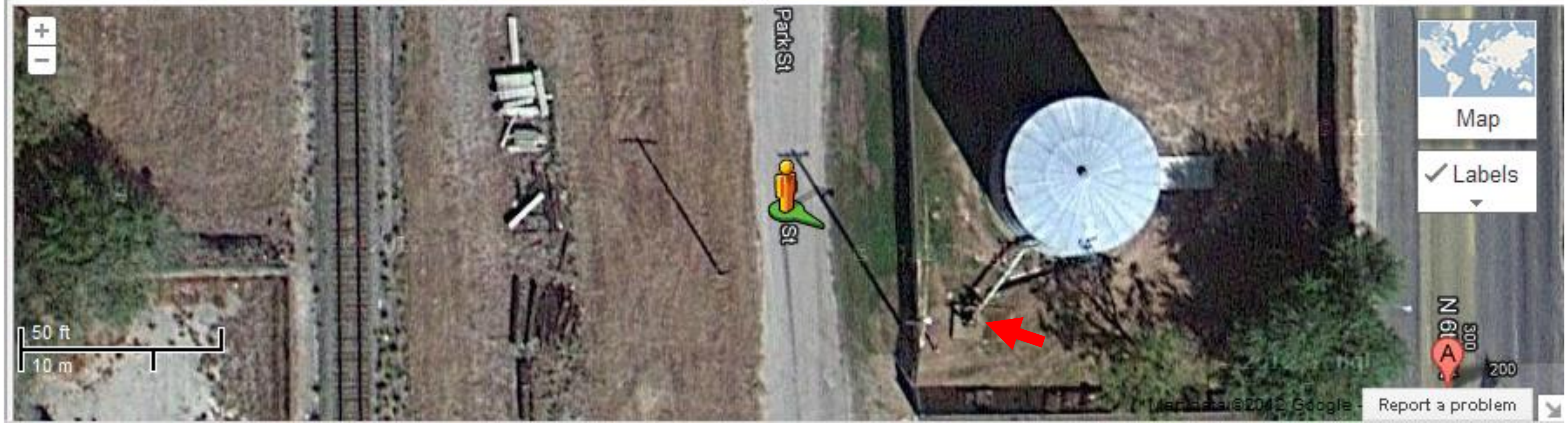
Report generated on:
9/12/2012

- Radionuclide Results Report: CITY OF KINGSVILLE PWSID TX1370001 for samples collected between 1/1/2000 and 9/12/2012

Report Description: Detailed Radionuclide result for a system by entry point and sample given a user defined date range and PWS ID.

CITY OF KINGSVILLE (TX1370001) - EP004 "GST" 1/1/2000 - 9/12/2012

TCEQ ID	LAB ID	TEST NAME	RESULT	UNIT OF ME	SAMPLE DATE	SYSTEM ID	CONT ID	POC 1
1153870	AB54309	Gross Alpha, Incl. Radon & U	15.4	pCi/L	04/20/2011	1370001	4002	EP004
1153870	AB54309	Gross Beta Particle Activity	7.4	pCi/L	04/20/2011	1370001	4100	EP004
1153870	AB54309	Radium-226		Non-Detect	04/20/2011	1370001	4020	EP004
1153870	AB54309	Radium-228		Non-Detect	04/20/2011	1370001	4030	EP004
1153870	AB54309	Uranium-238 ←	2.7	pCi/L	04/20/2011	1370001	4009	EP004
1153870	AB54309	Uranium-234 ←	6.5	pCi/L	04/20/2011	1370001	4007	EP004
1153870	AB54309	Uranium-235 ←		Non-Detect	04/20/2011	1370001	4008	EP004
		Combined Uranium	**8.0**	**µg/L**				
		Gross Alpha, Excl. Radon & U	**10.0**	**pCi/L**				
		Combined Radium (-226 & -228)		**Non-Detect**				
0828826	AA51939	Gross Alpha, Incl. Radon & U	10.1	pCi/L	02/12/2008	1370001	4002	EP004
0828826	AA51939	Gross Beta Particle Activity	5.4	pCi/L	02/12/2008	1370001	4100	EP004
0828826	AA51939	Radium-226		Non-Detect	02/12/2008	1370001	4020	EP004
0828826	AA51939	Radium-228		Non-Detect	02/12/2008	1370001	4030	EP004
		Combined Radium (-226 & -228)		**Non-Detect**				
0525248	EP506258	Gross Beta Particle Activity	10.3	pCi/L	03/07/2005	1370001	4100	EP004
0525248	EP506258	Radium-226		Non-Detect	03/07/2005	1370001	4020	EP004
0525248	EP506258	Radium-228		Non-Detect	03/07/2005	1370001	4030	EP004
0525248	EP506258	Gross Alpha Particle Activity	11.9	pCi/L	03/07/2005	1370001	4109	EP004
	EP204782	Gross Beta Particle Activity	9.2	pCi/L	03/12/2002	1370001	4100	EP004
	EP204782	Radium-226		Non-Detect	03/12/2002	1370001	4020	EP004
	EP204782	Radium-228		Non-Detect	03/12/2002	1370001	4030	EP004
	EP204782	Gross Alpha Particle Activity	12.2	pCi/L	03/12/2002	1370001	4109	EP004


Park Street, Kingsville, Texas, United States
Address is approximate
« Photos
Park St
© 2012 Google
Report a problem
Image Date: April 2011

Park St
Map
Labels
50 ft
10 m
Report a problem

The Goliad Aquifer's **Baseline Water Quality** in the Garcia Hill Area Part II

Like Slide 32, Slide 51 illustrates the wells for which GR Log analysis was conducted (see arrows). The GR Log analysis work performed for these wells was described in detail in an 11/21/14 (141121….) document provided to the Kleberg County citizens who requested technical assistance with information on uranium ore grades in the Garcia Hill area. A summary of the estimated uranium ore grade values, expressed as %U3O8, for these wells is shown in Slide 52.

The information in Slide 53 was used to develop an idea of the meaning of the above estimated ore grade values by comparing them to ore grade values that define an economically viable Uranium mine. The bar graph in Slide 54 helps understand how close each one the above wells came to being in a Uranium mine, in the sense described in Slide 53.

The information in Slide 53 also helps visualize the connection between the observed Uranium concentrations in the ground water and the estimated grade of the ore present in the formation containing that water, that is, before the aquifer was disturbed. Based on these observations, it can be said that the estimated uranium ore grade values validate the estimated baseline Water Quality conditions in the area where these wells are located, the Garcia Hill area, and the assessment that this is drinking water.

Slide 55 illustrates how the uranium ore values computed during this data review exercise compare to those values computed by consulting firm Computer Logging Incorporated. This exercise most definitely validates the used engineering evaluation approach for determining uranium ore grades from GR Logs. Details on the hereby used evaluation approach, contained in an Excel computer program, are provided in Slides 56 and 57.

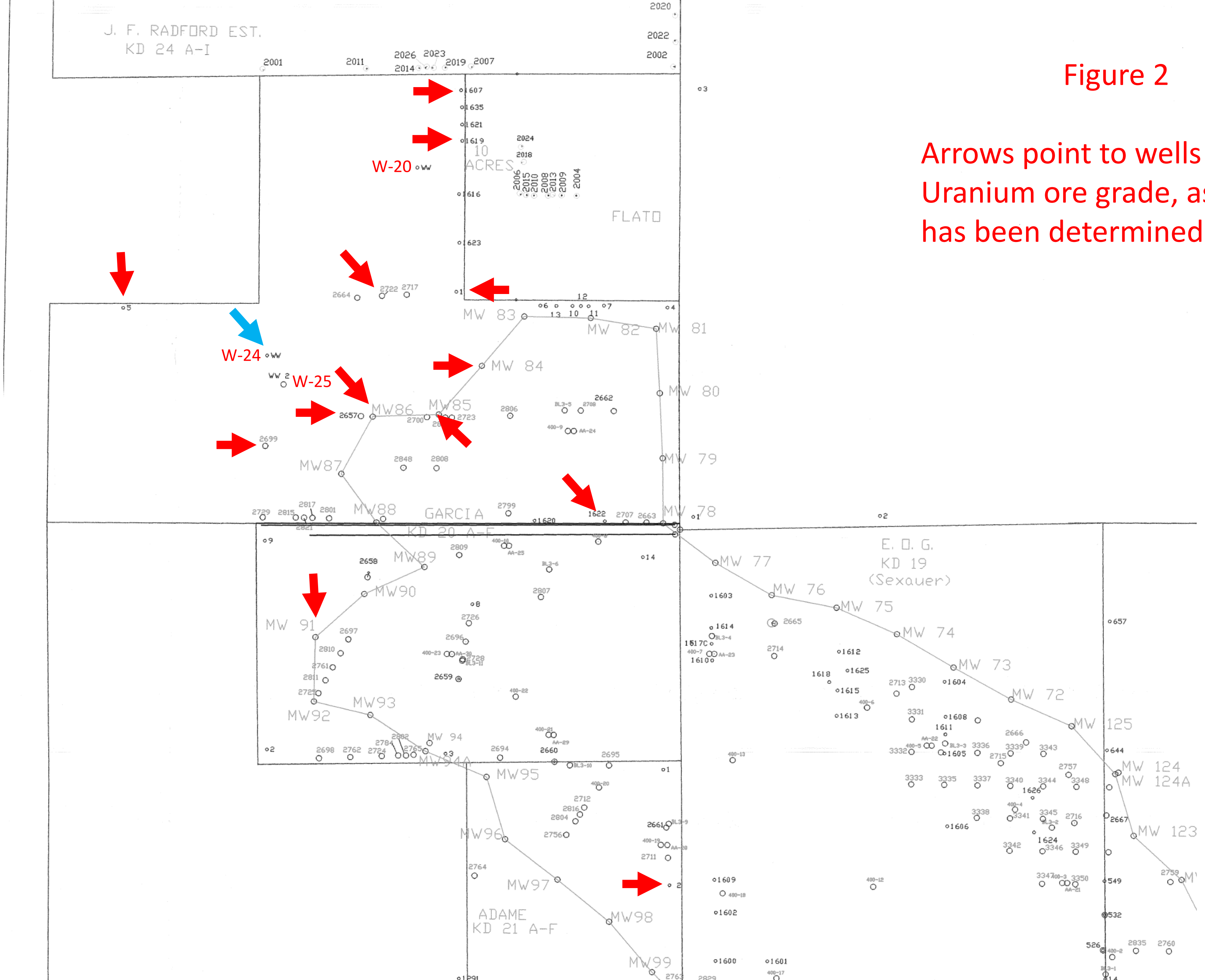


Figure 2

Arrows point to wells for which Uranium ore grade, as %U3O8, has been determined.

Table II.- Summary of Highest Uranium Ore Grade Values Estimated from GR Log Readings for the Selected Garcia Hill Area Wells

	GH W-24	Garcia 2699	Garcia 2657	MW-86	Garcia 2722	Garcia 5	Garcia 1	MW-84
Ft From GH W-24 (approx.)	0	547	681	739	787	915	1207	1302
"B" Sand Interval?	Yes 508 - 621	Yes 562 - 633	Yes 550 - 634	Yes 535 - 629	Yes 538 - 606	Yes 555 - 628	Yes 530 - 600	Yes 538 - 615
"B" Sand Highst. Ore Grade Read (%eU3O8)	0.0030 @ 575.0	0.0062 @ 573.5	Essentially Flat GR Curve	0.0025 @ 564.5	0.0281 @ 554.5	Essentially Flat GR Curve	0.0071 @ 554.0	0.0076 @ 577.0
"A" Sand Interval?	Yes 625 - 691	Yes 643 - 705	Yes 640 - 663	Yes 640 - 670	Yes 611 - 650	Yes 640 - 692	Yes 611 - 678	Yes 661 - 675
"A" Sand Highst. Ore Grade Read (%eU3O8)	Essentially Flat GR Curve	Essentially Flat GR Curve	Essentially Flat GR Curve	Essentially Flat GR Curve	Essentially Flat GR Curve	Essentially Flat GR Curve	Essentially Flat GR Curve	Essentially Flat GR Curve
"AA" Sand Interval?	Yes 695 - 747	Yes 709 - 780	Yes 692 - 761	Yes 688 - 719	Yes 686 - 780	Yes 695 - 750	Yes 681 - 762	Yes 678 - 773
"AA" Sand Highst. Ore Grade Read (%eU3O8)	Essentially Flat GR Curve	0.0035 @737.5	0.0055 @ 746.5	Essentially Flat GR Curve	Essentially Flat GR Curve	Essentially Flat GR Curve	Essentially Flat GR Curve	Essentially Flat GR Curve
Initial U mg/L	0.032 0.011	Drilled & Abandoned	Drilled & Abandoned	0.019	Drilled & Abandoned	Drilled & Abandoned	Drilled & Abandoned	0.031

	Expl G1607	Expl G1619	Expl G1622
Ft From GH W-20 (approx.)	550	335	2500
"B" Sand Highst. Ore Grade Read (%eU3O8)	0.0100 @ 553.5	0.0229 @ 572.0	0.1572 @ 585.5
"AA" Sand Highst. Ore Grade Read (%eU3O8)	0.0438 @ 729.0	0.0071 @ 726.0	
	Drilled & Abandoned	Drilled & Abandoned	PA-3 Producer 13222?

All Distances and Depths are approximate.

The economic evaluation of the Roca Honda uranium resource was prepared under the supervision of Stuart E. Collins of Roscoe Postle (USA) Ltd., Lakewood, Colorado. Mr. Collins is a Registered Professional Mining Engineer in the state of Colorado, and is a registered member of the Society for Mining and Metallurgy, and Exploration, and an independent and Qualified Person as defined in NI 43-101.

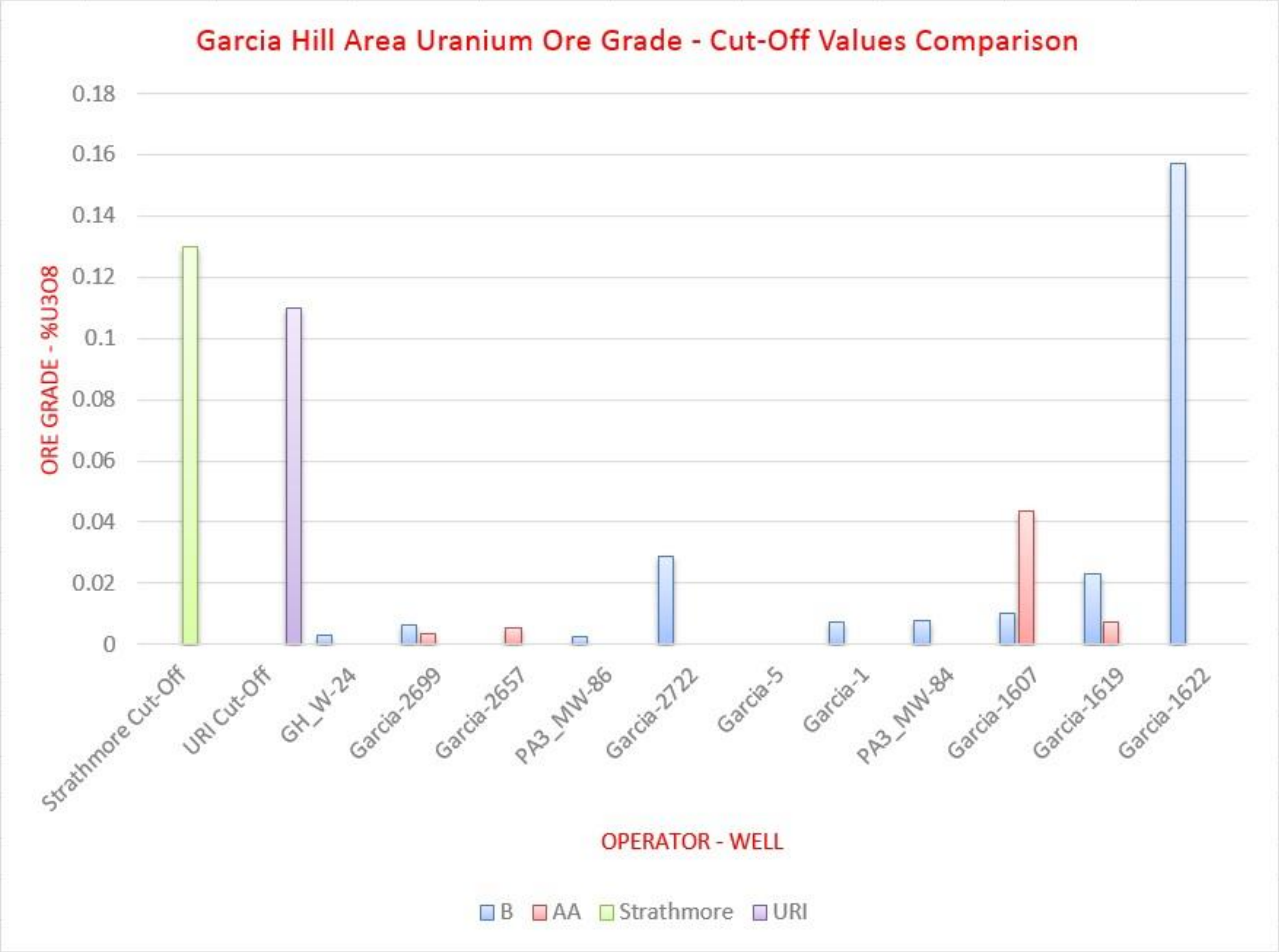
Summary of Roca Honda Mineral Resources as at August 9, 2011:
Measured and Indicated Resources:

Classification	Tons	Grade % U_3O_8	Lb U_3O_8
Measured	284,000	0.395	2,247,000
Indicated	1,793,000	0.405	14,536,000
Total M+I	**2,077,000**	**0.404**	**16,783,000**
Inferred Resource:			
Classification	**Tons**	**Grade % U_3O_8**	**Lb U_3O_8**
Inferred	1,448,000	0.411	11,894,000

Notes:

1. CIM definitions were followed for Mineral Resources.
2. The Qualified Person for this Mineral Resource estimate is Patti Nakai-Lajoie, P.Geo.
3. Mineral Resources are estimated using a cut-off grade of 0.13% U3O8.
4. A minimum mining thickness of six feet was used.
5. Numbers may not add due to rounding.

The modeling and estimation of the uranium resources were prepared under the supervision of Patti Nakai-Lajoie, P.Geo. and Principal Geologist, RPA. Ms. Nakai-Lajoie is a Professional Geoscientist in the Province of Ontario and an independent and Qualified Person as defined in NI 43-101. Ms. Nakai-Lajoie visited the Roca Honda Property on May 10-12, 2011 and is of the opinion that the data verification procedures support the geologic interpretations and confirm the quality of the database. It should be noted that mineral resources, which are not mineral reserves, do not have demonstrated economic viability.


Garcia Hill Area Uranium Ore Grade - Cut-Off Values Comparison
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
ORE GRADE - %U3O8
Strathmore Cut-Off
URI Cut-Off
GH_W-24
Garcia-2699
Garcia-2657
PA3_MW-86
Garcia-2722
Garcia-5
Garcia-1
PA3_MW-84
Garcia-1607
Garcia-1619
Garcia-1622
OPERATOR - WELL
B
AA
Strathmore
URI

COMPUTER LOGGING INCORPORATED

URANIUM DATA ANALYSIS

CLIENT: U.R.I.
HOLE NO: ADAMI#2
DATE: 12-07-87

K-FACTOR= .00000630
CORRECTION FACTOR= 1.150

DEADTIME (MICROSEC.)= .00000025

DEPTH (FT)	RAW CPS	CORRECTED CPS	GRADE %U308	CUT #1 .020	CUT #2 .050	CUT #3 .080	CUT #4 .100	%U3O8 HOLE SIZE AND WATER CORR. GRADE
662.0	194.	194.	.003					0.0028
662.5	223.	223.	.003					0.0033
663.0	266.	266.	.004					0.0039
663.5	353.	353.	.005					0.0052
664.0	638.	638.	.009					0.0093
664.5	1170.	1171.	.017					0.0171
665.0	1649.	1650.	.024	.024				0.0242
665.5	1809.	1810.	.026	.026				0.0265
666.0	1686.	1686.	.024	.024				0.0247
666.5	1618.	1619.	.023	.023				0.0237
667.0	1789.	1790.	.026	.026				0.0262
667.5	2255.	2257.	.033	.033				0.0330
668.0	2321.	2322.	.034	.034				0.0340
668.5	1692.	1692.	.025	.025				0.0248
669.0	999.	999.	.014					0.0146
669.5	603.	604.	.009					0.0088
670.0	467.	467.	.007					0.0068
670.5	397.	397.	.006					0.0058

CUTOFF NUMBER 1
NUMBER OF HALF-FOOT INTERVALS: 8
AVERAGE GRADE= .027
GRADE-THICKNESS PRODUCT= .107

ORE GRADE AND GRADE-THICKNESS CALCULATION
Background to Background Method (Continues)

Given Data					
Data Entered by Logger					
Calculated Data					
DATE:					
WELL NAME:	Adami No. 2				
LOGGING ENGINEER:					
UNIT No.:					
PROBE No.:					
INTERVAL: Ft	0.5				
BIT SIZE: in Inches	5.125				
WATER IN HOLE? (Y/N)	y				
WATER CORRECTION:	1.14861875				
STEEL PIPE IN HOLE? (Y/N)	n				
THICKNESS: in Inches	1				
STEEL CORRECTION:	1				
DEAD TIME:	2.50000E-07				
K FACTOR:	6.30000E-06				
			GRADE=	**0.01714317**	%eU308
			GRADE-THICKNESS=	**0.14571697**	
Interval Of Interest:	662.00	to		670.50	
KVD's PA-3 Adami No. 2					

ORE GRADE AND GRADE-THICKNESS CALCULATION (Concluded)

Background to Background Method

KVD's PA-3 Adami No. 2						
DEPTH	GAMMA-HI CPS PROBE COUNTS		GAMMA-HI CPS, CORRECTED	%eU3O8 RADIOMETRIC GRADE PER UNIT	HOLE SIZE AND WATER CORR. GRADE	STEEL CASING CORRECTED GRADE
662.00	194.00		194.01	0.0024	0.0028	0.0028
662.50	223.00		223.01	0.0028	0.0033	0.0033
663.00	266.00		266.02	0.0034	0.0039	0.0039
663.50	353.00		353.03	0.0044	0.0052	0.0052
664.00	638.00		638.10	0.0080	0.0093	0.0093
664.50	1170.00		1170.34	0.0147	0.0171	0.0171
665.00	1649.00		1649.68	0.0208	0.0242	0.0242
665.50	1809.00		1809.82	0.0228	0.0265	0.0265
666.00	1686.00		1686.71	0.0213	0.0247	0.0247
666.50	1618.00		1618.65	0.0204	0.0237	0.0237
667.00	1789.00		1789.80	0.0226	0.0262	0.0262
667.50	2255.00		2256.27	0.0284	0.0330	0.0330
668.00	2321.00		2322.35	0.0293	0.0340	0.0340
668.50	1692.00		1692.72	0.0213	0.0248	0.0248
669.00	999.00		999.25	0.0126	0.0146	0.0146
669.50	603.00		603.09	0.0076	0.0088	0.0088
670.00	467.00		467.05	0.0059	0.0068	0.0068
670.50	397.00		397.04	0.0050	0.0058	0.0058

PA-3 Documented Fluids Flow

The pictures in Slide 59 illustrate the diffusion and attenuation patterns for a disturbance introduced into a homogeneous medium. The footprint of injection and production wells in an aquifer may approach a similar pattern if the formation is relatively homogeneous, isotropic. In other words, the flow pattern of fluids, whether being injected or withdrawn, may approach a radial flow pattern. If this is the case, the well's footprint in the aquifer may approach the appearance of a circle, as opposed to that of a cigar, which may exist in the presence of extreme heterogeneities in the aquifer rock and other factors.

A 48 hour pumping test was performed in KVD's PA-3 in order to determine whether or not the Monitoring Well Ring would be effective in the detection of excursions. The locations of the wells used in the Pumping Test are illustrated in the map in Slide 60 (see arrows). The Tables in Slides 61 and 63 provide the drawdown data gathered during the test, and the maps in Slides 62 and 64 illustrate possible flow paths for the produced water, based on the data from the above Tables.

An analysis of the above data indicates that, during the pumping test, the water flowed to the pumped wells in a pattern very close to that of radial flow. This means that Goliad Aquifer wells at PA-3 are likely to impact the aquifer in every direction around each well. This fact should not come as a surprise in light of the drawdown effects observed throughout the Goliad Aquifer in the Kingsville area (see Slide 14, observe blue circle in Slides 33 and 65).

The fluid flow information gathered through the execution of the above pumping test is more than enough to infer that the Goliad Aquifer in the Kingsville area has a very large transmissibility, a fact that has been pointed to by several researchers. Slides 98 and 99 illustrate the development of an estimate of permeability for the Goliad Aquifer in Kleberg County using an Excel computer program, and based on the results of well pumping tests.

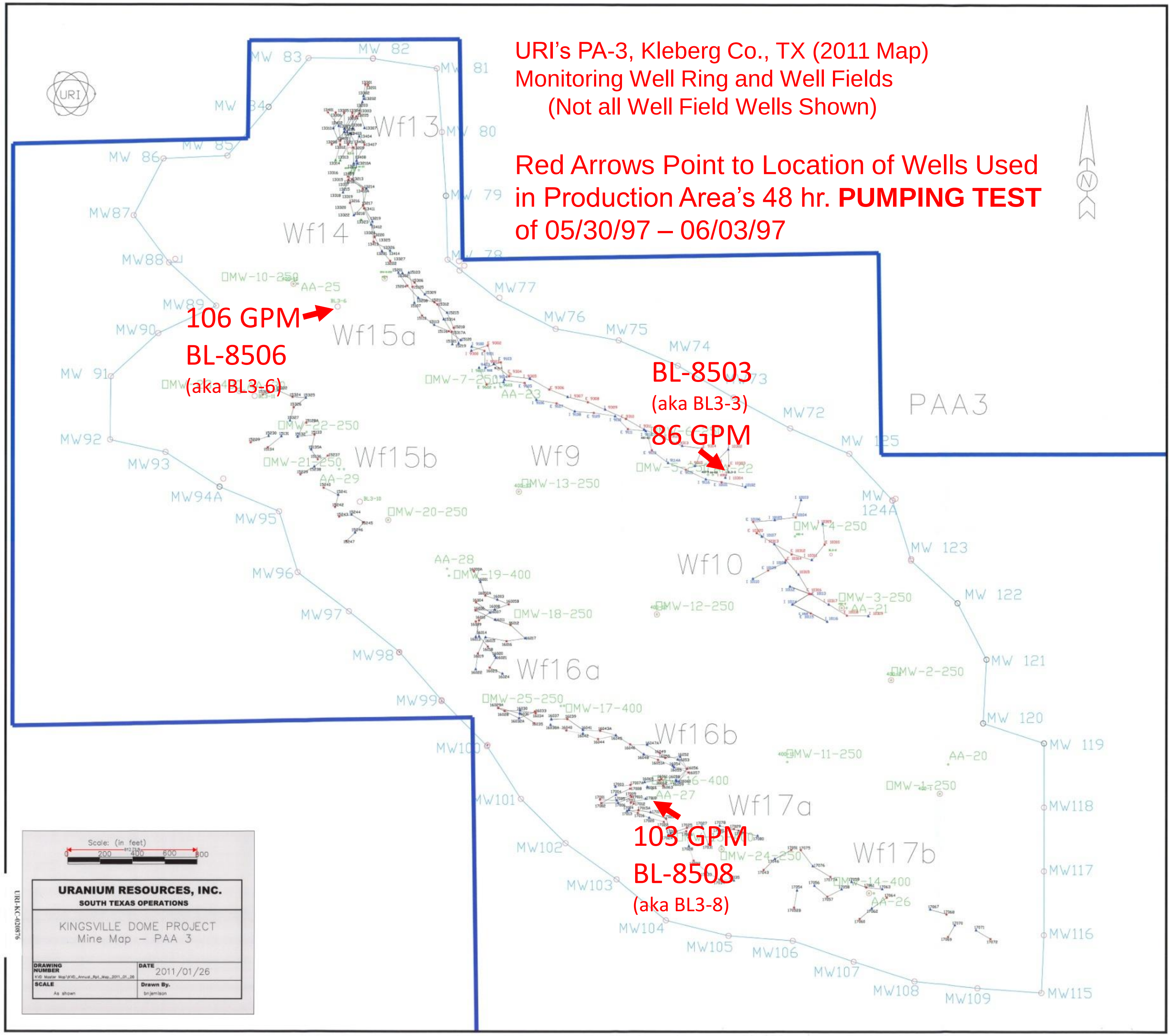

URI's PA-3, Kleberg Co., TX (2011 Map)
Monitoring Well Ring and Well Fields
(Not all Well Field Wells Shown)
Red Arrows Point to Location of Wells Used in Production Area's 48 hr. **PUMPING TEST** of 05/30/97 – 06/03/97
106 GPM
BL-8506
(aka BL3-6)
BL-8503
(aka BL3-3)
86 GPM
103 GPM
BL-8508
(aka BL3-8)
URI
Wf13
Wf14
Wf15a
Wf15b
Wf9
Wf10
Wf16a
Wf16b
Wf17a
Wf17b
PAA3
N
Scale: (in feet)
0 200 400 600 800
URANIUM RESOURCES, INC.
SOUTH TEXAS OPERATIONS
KINGSVILLE DOME PROJECT
Mine Map – PAA 3
DRAWING NUMBER
DATE 2011/01/26
SCALE
As shown
Drawn By.

TABLE TWO

URI kINGSVILLE Project

PAA-3 Pump Test

Well Number	Role	Starting Fluid Level (Ft. MSL)	Final Fluid Level (Ft. MSL)	Drawdown (Ft.)	Nearest Pump Well	Distance (Ft.)
BL-8501	OBS.	-76.51	-83.04	-6.53	BL-8503	1741
BL-8502	OBS.	-64.10	-68.78	-4.68	BL-8503	831
BL-8503	PUMP	-65.78	-129.16	-63.38	NA	NA
BL-8504	OBS.	-64.93	-74.65	-9.72	BL-8506	1066
BL-8505	OBS.	-68.76	-76.37	-7.61	BL-8506	983
BL-8506	PUMP	-51.67	-90.88	-39.21	NA	NA
BL-8507	OBS.	-56.08	-56.25	-0.17	BL-8508	1597
BL-8508	PUMP	-58.76	-111.40	-52.64	NA	NA
MW-76	OBS.	-65.62	-76.10	-10.48	BL-8506	1362
MW-77	OBS.	-61.14	-69.56	-8.42	BL-8506	1007
MW-78	OBS.	-66.63	-74.18	-7.55	BL-8506	744
MW-79	OBS.	-60.78	-94.83	-34.05	BL-8506	967
MW-80	OBS.	-68.67	-75.89	-7.22	BL-8506	984
MW-81	OBS.	-79.58	-85.96	-6.38	BL-8506	1618
MW-82A	OBS.	-69.67	-76.25	-6.58	BL-8506	1568
MW-83	OBS.	-69.89	-76.17	-6.28	BL-8506	1567
MW-84	OBS.	-70.61	-76.65	-6.04	BL-8506	1321
MW-85	OBS.	-69.56	-75.78	-6.22	BL-8506	1166
MW-86	OBS.	-69.92	-76.06	-6.14	BL-8506	1425
MW-87	OBS.	-69.00	-74.82	-5.82	BL-8506	1389
MW-88	OBS.	-62.55	-68.49	-5.94	BL-8506	1084
MW-89	OBS.	-67.56	-74.28	-6.72	BL-8506	754
MW-90	OBS.	-67.38	-73.78	-6.40	BL-8506	1128
MW-91	OBS.	-69.69	-70.67	-0.98	BL-8506	1474
MW-92	OBS.	-65.06	-65.23	-0.17	BL-8506	1640
MW-93	OBS.	-63.83	-64.94	-1.11	BL-8506	1406
MW-94A	OBS.	-65.23	-68.43	-3.20	BL-8506	1346
MW-95	OBS.	-63.69	-68.53	-4.84	BL-8506	1333
MW-96	OBS.	-59.96	-65.40	-5.44	BL-8506	1682
MW-97	OBS.	-61.84	-67.35	-5.51	BL-8506	1926

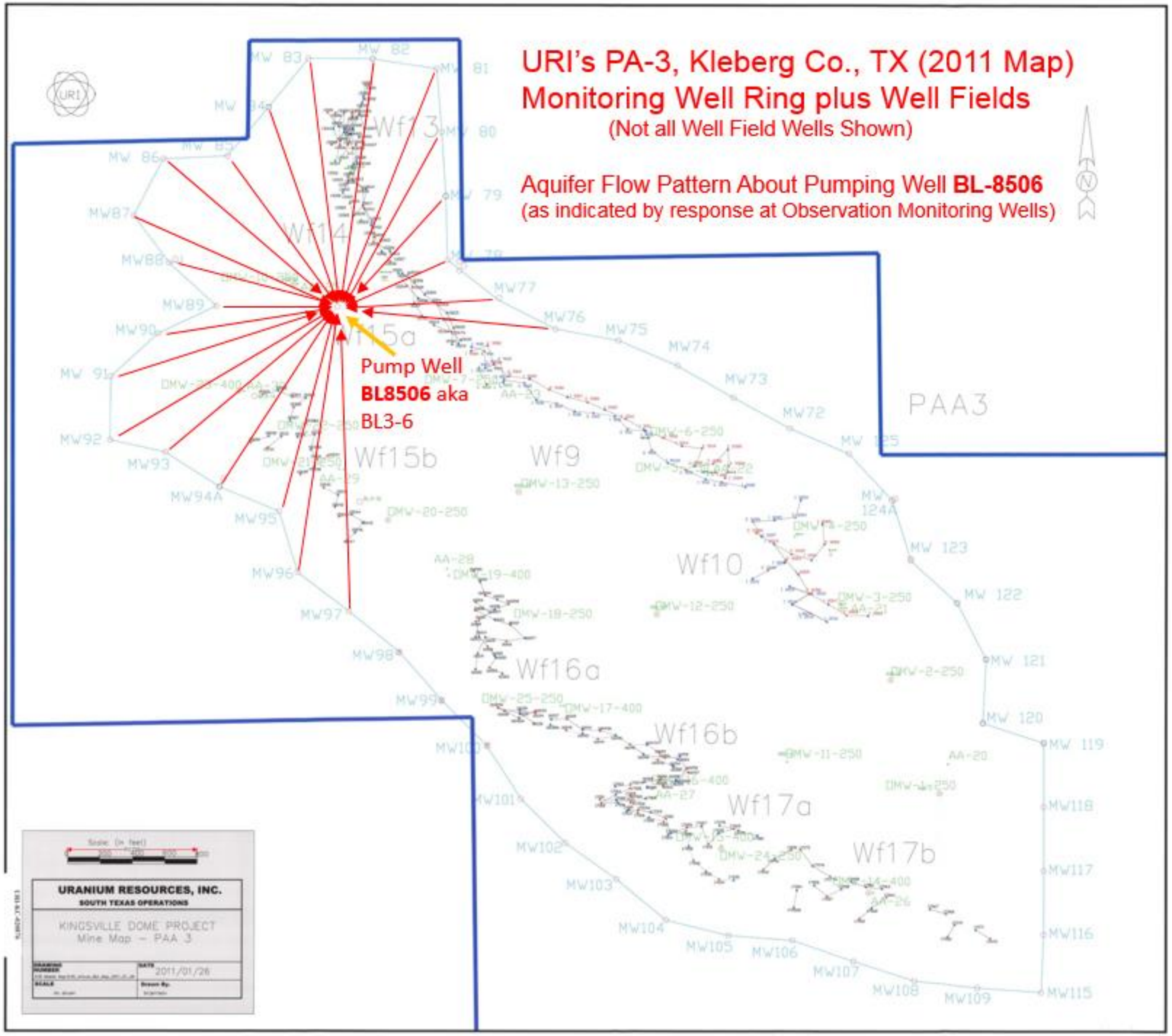
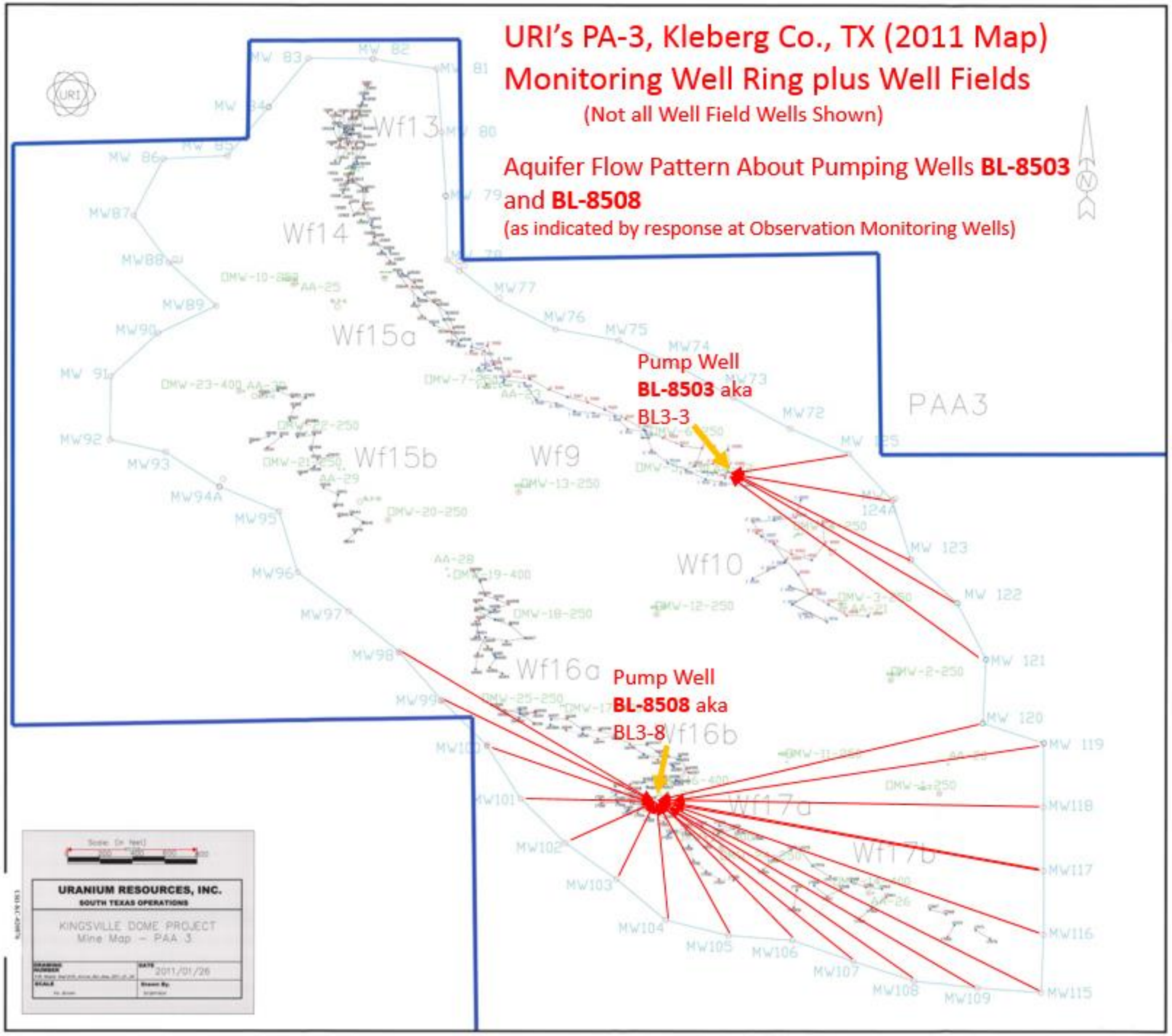

URI's PA-3, Kleberg Co., TX (2011 Map)
Monitoring Well Ring plus Well Fields
(Not all Well Field Wells Shown)
Aquifer Flow Pattern About Pumping Well **BL-8506**
(as indicated by response at Observation Monitoring Wells)
Pump Well
BL8506 aka
BL3-6
Wf13
Wf14
Wf15a
Wf15b
Wf9
Wf10
Wf16a
Wf16b
Wf17a
Wf17b
PAA3
URANIUM RESOURCES, INC.
SOUTH TEXAS OPERATIONS
KINGSVILLE DOME PROJECT
Mine Map – PAA 3
2011/01/26

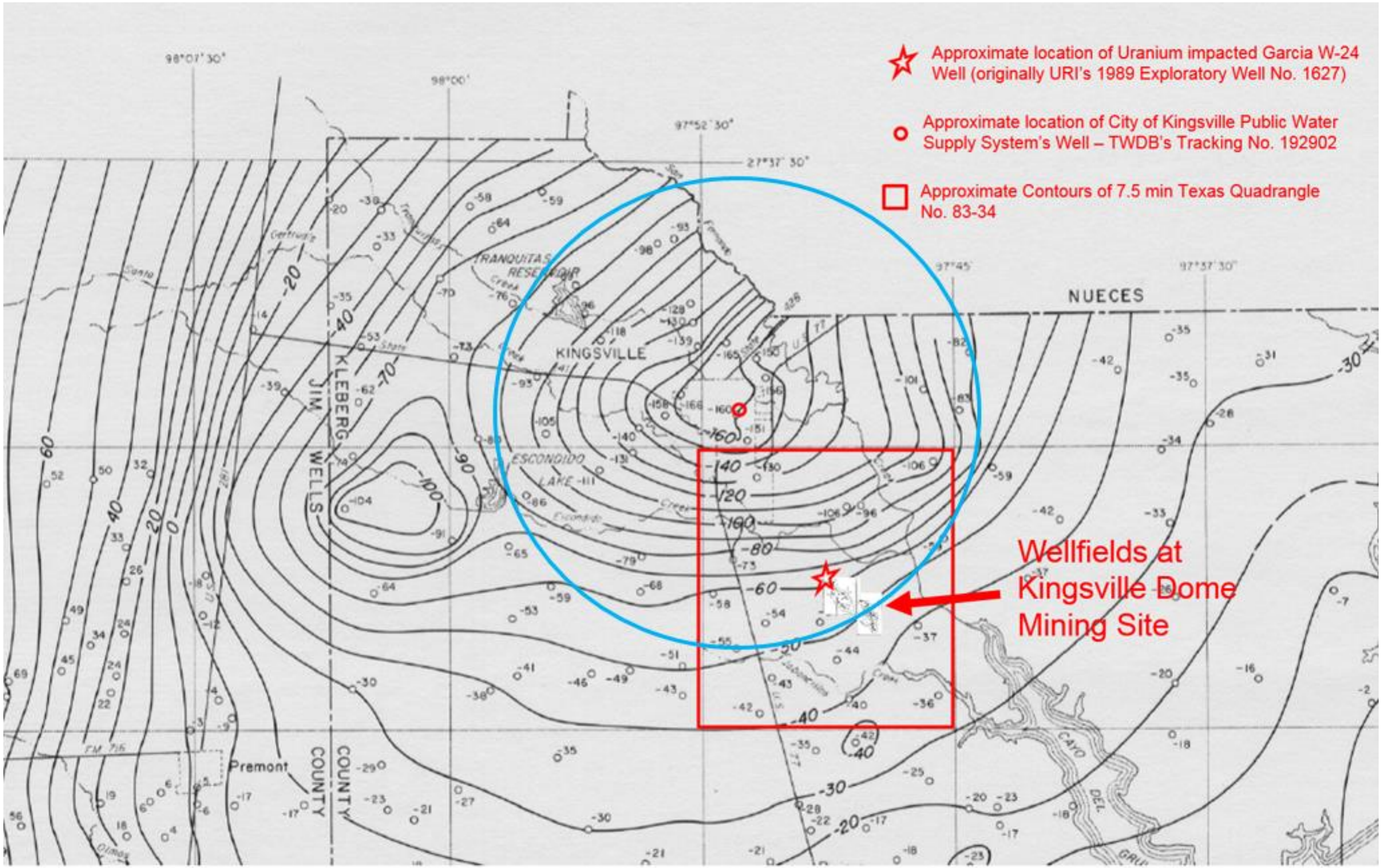
TABLE TWO

URI kINGSVILLE Project

PAA-3 Pump Test

Well Number	Role	Starting Fluid Level (Ft. MSL)	Final Fluid Level (Ft. MSL)	Drawdown (Ft.)	Nearest Pump Well	Distance (Ft.)
BL-8501	OBS.	-76.51	-83.04	-6.53	BL-8503	1741
BL-8502	OBS.	-64.10	-68.78	-4.68	BL-8503	831
BL-8503	PUMP	-65.78	-129.16	-63.38	NA	NA
BL-8504	OBS.	-64.93	-74.65	-9.72	BL-8506	1066
BL-8505	OBS.	-68.76	-76.37	-7.61	BL-8506	983
BL-8506	PUMP	-51.67	-90.88	-39.21	NA	NA
BL-8507	OBS.	-56.08	-56.25	-0.17	BL-8508	1597
BL-8508	PUMP	-58.76	-111.40	-52.64	NA	NA
MW-98	OBS.	-61.86	-67.58	-5.72	BL-8508	1807
MW-99	OBS.	-52.99	-58.50	-5.51	BL-8508	1434
MW-100	OBS.	-67.00	-67.17	-0.17	BL-8508	1069
MW-101	OBS.	-57.48	-63.79	-6.31	BL-8508	819
MW-102	OBS.	-57.80	-64.18	-6.38	BL-8508	623
MW-103	OBS.	-54.37	-55.80	-1.43	BL-8508	581
MW-104	OBS.	-56.31	-62.82	-6.51	BL-8508	797
MW-105	OBS.	-56.03	-62.04	-6.01	BL-8508	1007
MW-106	OBS.	-55.86	-61.32	-5.46	BL-8508	1429
MW-107	OBS.	-55.86	-60.50	-4.64	BL-8508	1633
MW-108	OBS.	-54.90	-58.81	-3.91	BL-8508	2007
MW-109	OBS.	-54.81	-57.66	-2.85	BL-8508	2360
MW-115	OBS.	-54.69	-57.18	-2.49	BL-8508	2722
MW-116	OBS.	-49.35	-52.10	-2.75	BL-8508	2592
MW-117	OBS.	-54.54	-58.08	-3.54	BL-8508	2484
MW-118	OBS.	-55.46	-59.39	-3.93	BL-8508	2438
MW-119	OBS.	-55.71	-59.31	-3.60	BL-8508	2458
MW-120	OBS.	-56.91	-61.11	-4.20	BL-8508	2104
MW-121	OBS.	-56.67	-60.97	-4.30	BL-8503	2001
MW-122	OBS.	-56.12	-62.81	-6.69	BL-8503	1657
MW-123	OBS.	-60.10	-68.11	-8.01	BL-8503	1270
MW-124A	OBS.	-57.21	-65.71	-8.50	BL-8503	1045
MW-125	OBS.	-57.75	-63.45	-5.70	BL-8503	773


URI's PA-3, Kleberg Co., TX (2011 Map)
Monitoring Well Ring plus Well Fields
(Not all Well Field Wells Shown)
Aquifer Flow Pattern About Pumping Wells BL-8503 and BL-8508
(as indicated by response at Observation Monitoring Wells)
Pump Well
BL-8503 aka
BL3-3
Pump Well
BL-8508 aka
BL3-8
Wf13
Wf14
Wf15a
Wf15b
Wf9
Wf10
Wf16a
Wf16b
Wf17a
Wf17b
PAA3
URANIUM RESOURCES, INC.
SOUTH TEXAS OPERATIONS
KINGSVILLE DOME PROJECT
Mine Map – PAA 3
2011/01/26



Approximate Potentiometric Surface, Goliad Aquifer, Kingsville Area, 1968-69 – TWDB Report 173 – 1973

Proof of Fluid Movement **Past** Monitoring Wells Provided by **Fluid Level Monitoring**

The cross sections in Slides 68 and 69 have been borrowed from the analysis of a deep injection well in order to illustrate a point regarding the analysis of mining operations at PA-3.

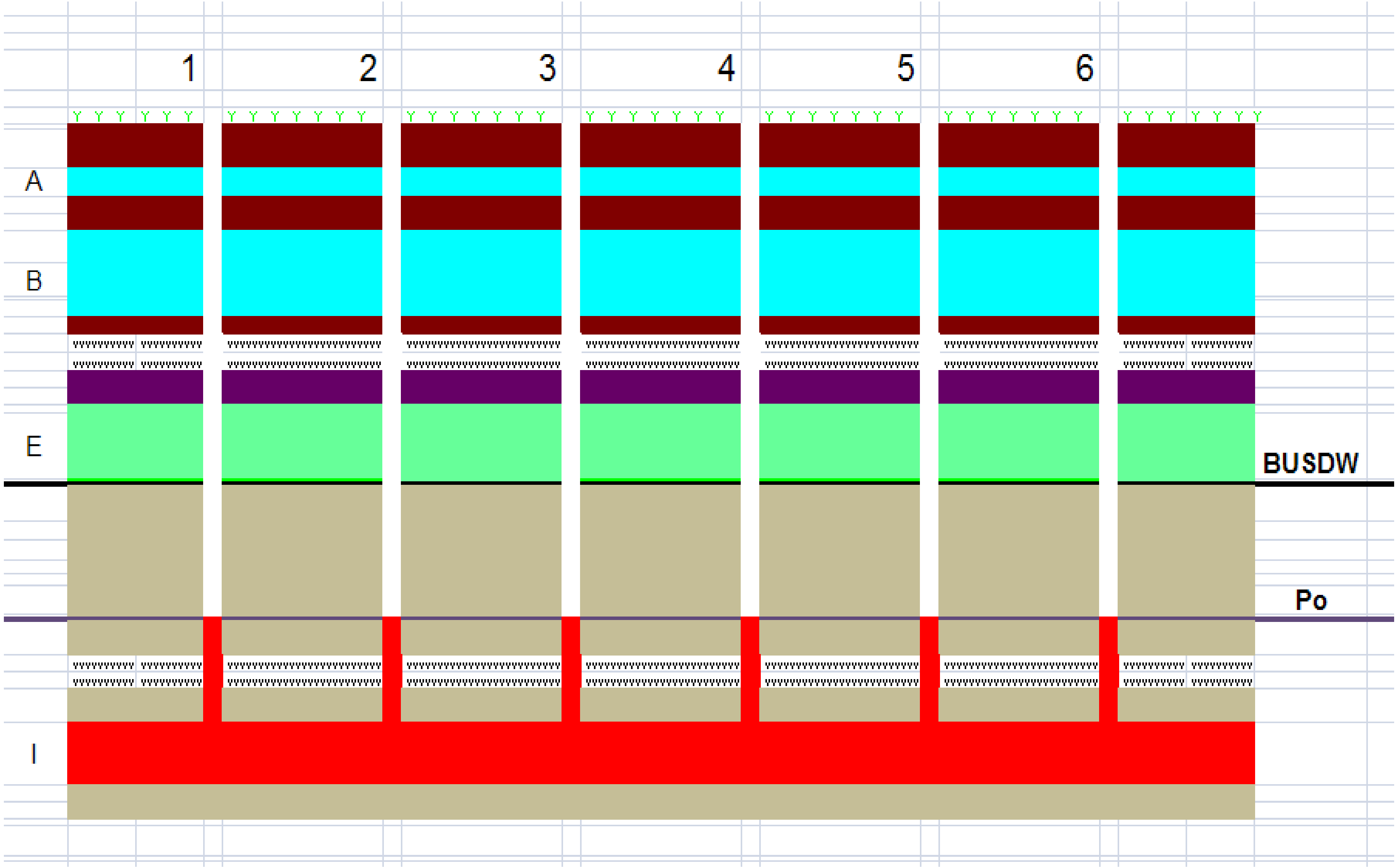
If one momentarily overlooks the effects of the pressure gradient in the Goliad Aquifer, then, in the absence of any other additional well operations, the pressure profile of the aquifer might look something like the figure in Slide 68. Slide 69 illustrates what the aquifer's pressure distribution might approximately look like in a segment of the aquifer after one injection well has operated for some time.

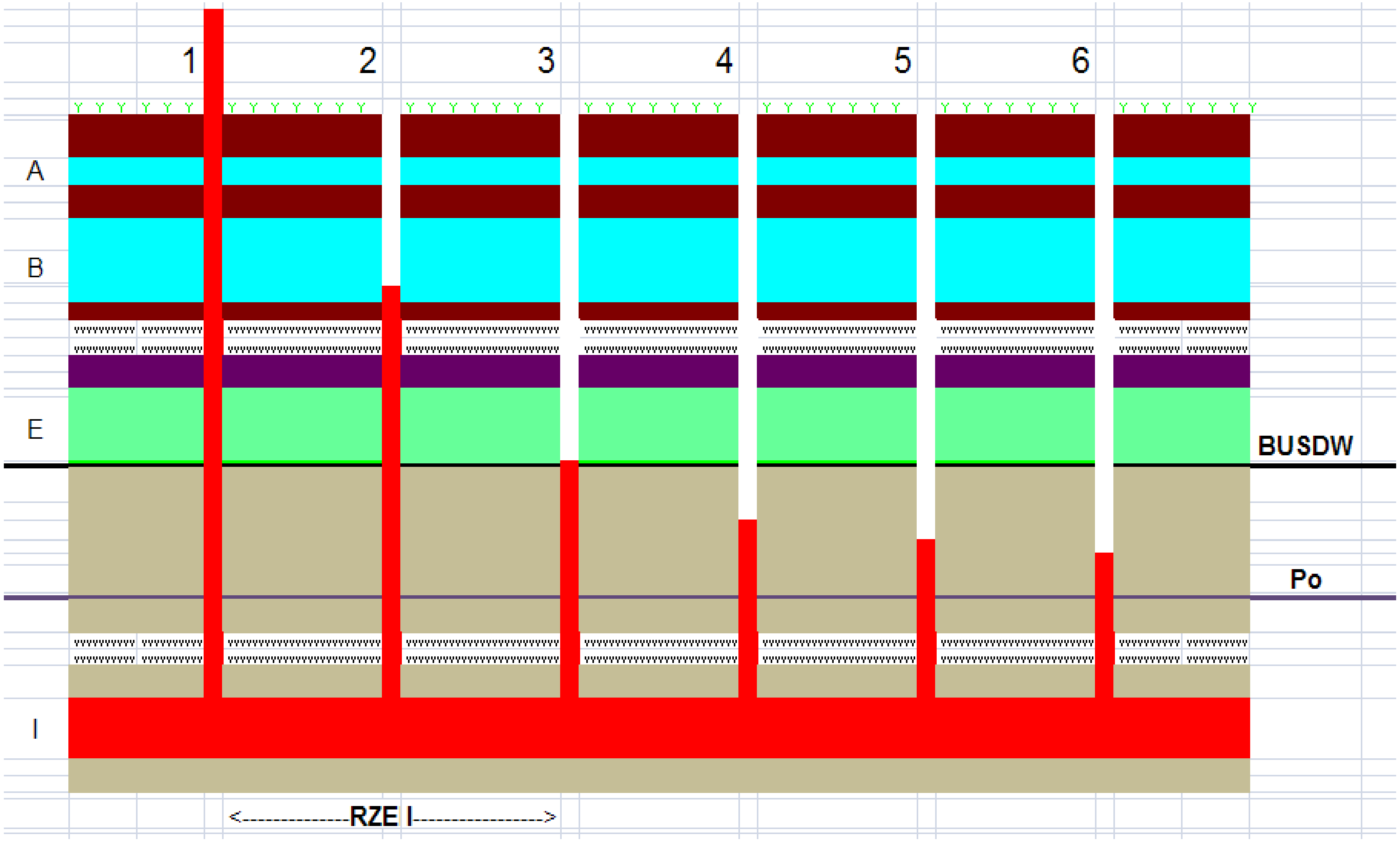
It is very important to keep in mind that these graphs, like the one in Slides 10 and 70, are not to scale, and that no effort has been made to account for the effects of the very real aquifer pressure gradient, whether natural or induced by well operations.

It was previously stated that, in the case of a Well Run in-situ solution mining operation, the aquifer's pressure profile in the area between an Injection and a Monitor Well should be expected to look like the one illustrated in Slides 10 and 70. That is, the Production Well should create a pressure sink between the injector and the Monitor Well. In the absence of such pressure sink, said aquifer's pressure profile might look like the one seen in Slide 69 (lets not forget, we are temporarily overlooking aquifer pressure gradient effects).

The pump test discussed above is one of the positive aspects of the operations at PA-3. One other positive aspect was the adoption of a Monitoring Well Fluid Level Monitoring Program. It did not come automatically but, without it, the analysis below might not have been possible.

The fluid level data and analysis shown below appear to indicate that at PA-3 the prevailing pressure profile must have looked something like the one illustrated in Slide 69. Well, the observed rise in fluid levels might have been more dramatic should the public water supply system in the city of Kingsville have gone down for an extended period of time.

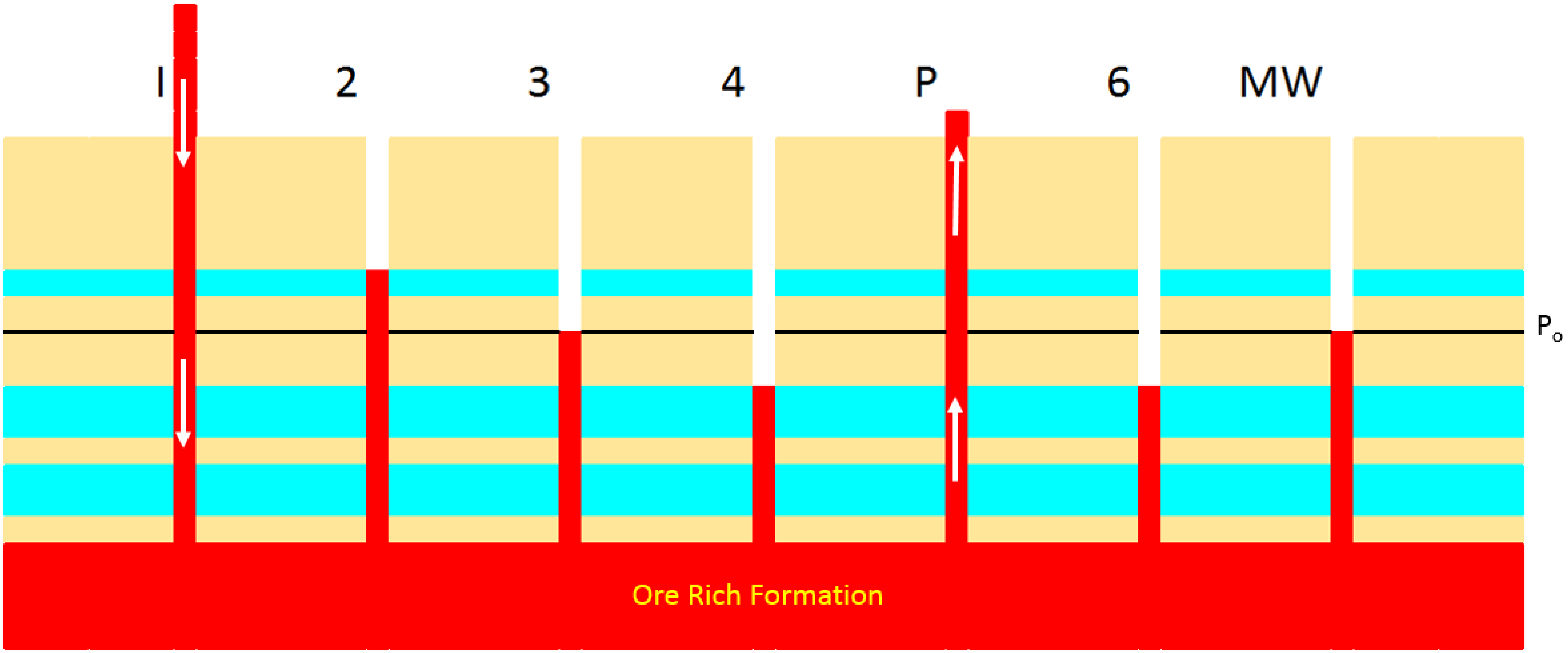

1
2
3
4
5
6
A
B
E
BUSDW
Po
I



1
2
3
4
5
6
A
B
E
I
BUSDW
Po
<-------------RZE I--------------->

Hydrostatic Heads in a Well Run Uranium *In-Situ* Solution Mining Operation

(Graph not to Scale, does not attempt to account for Natural Aquifer Pressure Gradient Effects)



I: Injection Well
P: Production Well
MW: Monitoring Well
P_o: Initial Res. Press.

The PA-3 mining activities schedule seen in Slides 72 and 73 appear posted on the map in Slide 74, next to their corresponding Wellfields, in order to better call attention to the character of the fluid movement patterns in the aquifer during mining operations. The blue arrows seen in this Slide point to the Monitoring Wells for which periodic fluid level measurement data were tabulated for a period of time, and were made available by Mr. George Rice.
It is thanks to having identified these fluid level monitoring data and data gathering points, along with the Wellfields periods of operation, that it has been possible to infer how some of the fluids moved within the aquifer during mining operations. Requests for well count and well identification data for PA-3, which might have helped refine this analysis, were unsuccessful.

Slide 75 illustrates the concept of time lapse imaging. The fluid level data for MW-91 (see blue arrow in Slide 74) seen in Slide 76 was provided by Mr. George Rice. These data have been presented as a time lapse image for this well in Slide 77. The same well is shown at different points in time (elapsed time is posted near the wellhead), and the observed fluid level change in the well is shown as a brown bar in the well schematic.

Double headed arrows below the well images show the period during which mining operations took place in a given Wellfield. The label on the double headed arrows identifies the Wellfield.

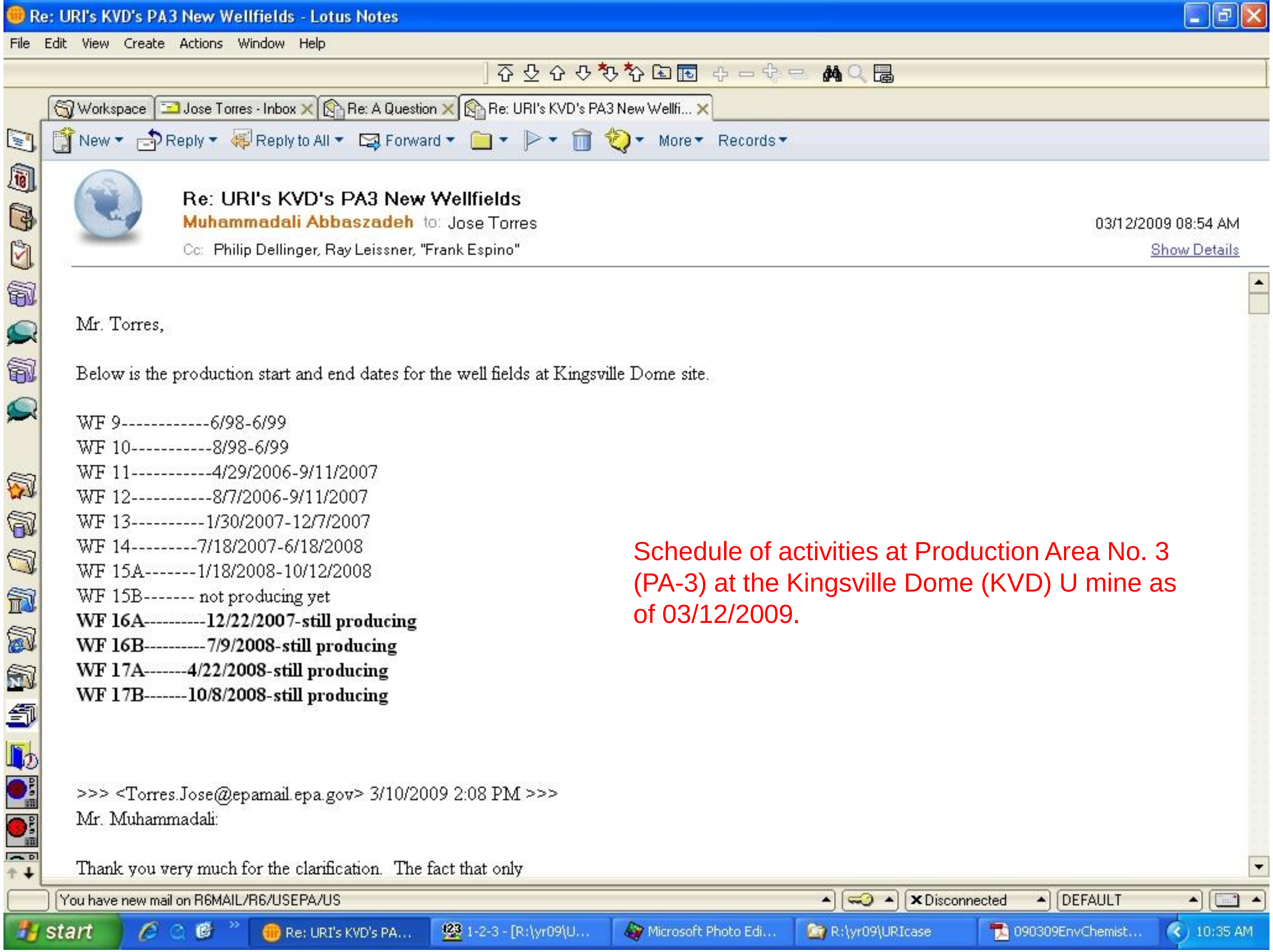
Observation of the Wellfield and well locations on the map, along with the observation of the occurrence of brown bars in the image conveys an idea of how far injected fluids may have traveled and for how long. In other words, the picture of an excursion has been painted by the time lapse image. The presence of the brown bars in this image attests to the implementation of injection activities on one hand, and to the absence of a pressure sink associated with them on the other hand.

Mr. Rice's data seen in Slide 78 has also been illustrated using the time lapse images shown in Slides 79 and 80, thus painting additional pictures of excursions at PA-3.

Another group of Monitoring Wells for which fluid level data were available is seen in the map in Slide 81 (see arrows). These data were also provided by Mr. Rice and appear tabulated in Slide 82 and have been illustrated using well schematics in Slide 83. In this case, Mr. Rice's average of the measured changes in each well's fluid level has also been shown as a brown bar in the well schematic.

A quick look at the location of the wells of interest in the map in Slide 81 (see arrows) confirms the already stated fact that, in this area of the Goliad Aquifer, wells can impact the aquifer in every direction (meaning that radial or nearly radial flow is generally achieved).

The stratigraphic columns in Slide 84 are provided to help better visualize and understand the fluid flow system at PA-3 and surrounding area.


Re: URI's KVD's PA3 New Wellfields

Muhammadali Abbaszadeh to: Jose Torres 03/12/2009 08:54 AM

Cc: Philip Dellinger, Ray Leissner, "Frank Espino"

Mr. Torres,

Below is the production start and end dates for the well fields at Kingsville Dome site.

WF 9------------6/98-6/99
WF 10-----------8/98-6/99
WF 11-----------4/29/2006-9/11/2007
WF 12-----------8/7/2006-9/11/2007
WF 13----------1/30/2007-12/7/2007
WF 14---------7/18/2007-6/18/2008
WF 15A-------1/18/2008-10/12/2008
WF 15B------- not producing yet
WF 16A---------12/22/2007-still producing
WF 16B---------7/9/2008-still producing
WF 17A-------4/22/2008-still producing
WF 17B-------10/8/2008-still producing

>>> <Torres.Jose@epamail.epa.gov> 3/10/2009 2:08 PM >>>
Mr. Muhammadali:

Thank you very much for the clarification. The fact that only

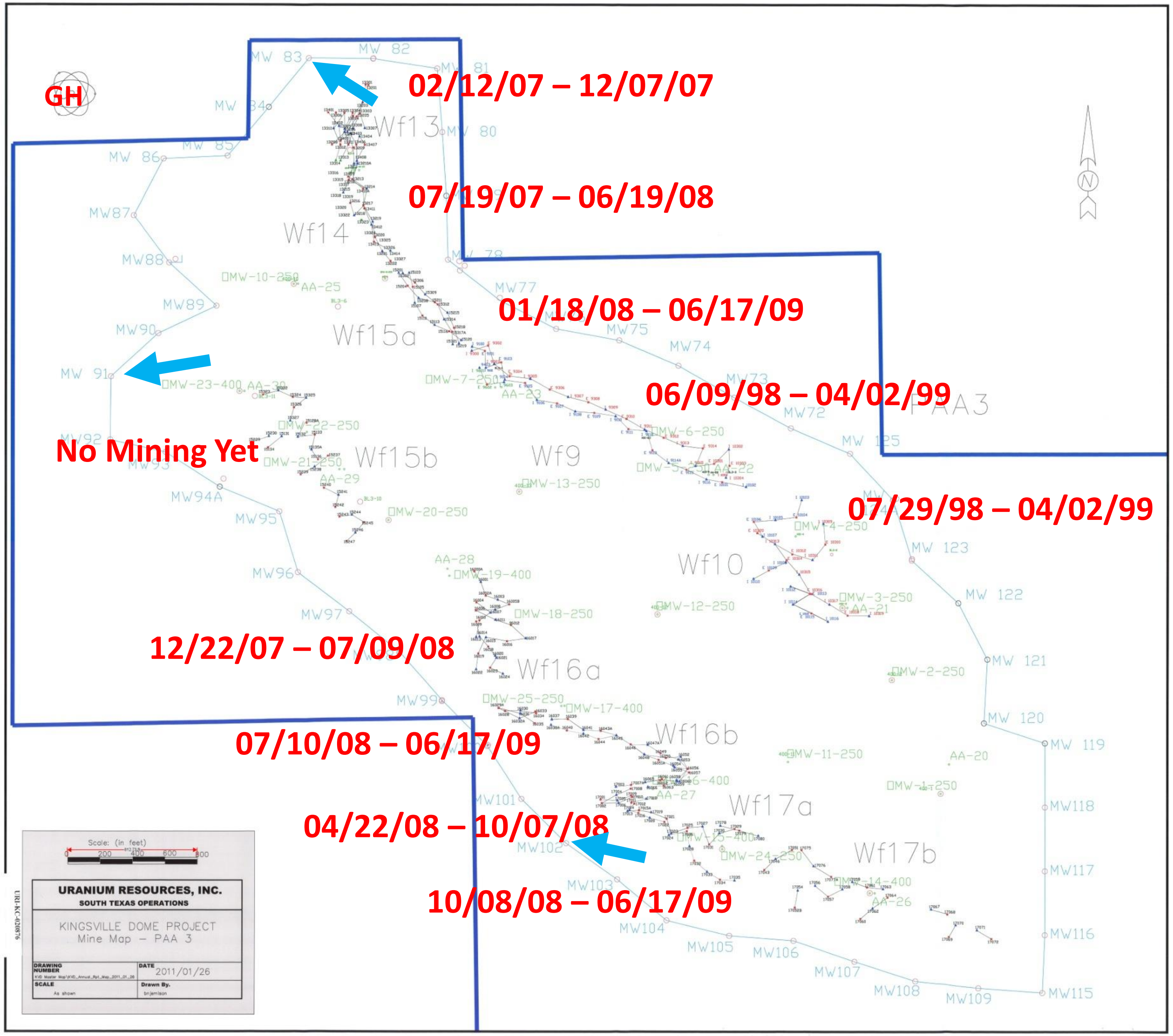
Schedule of activities at Production Area No. 3 (PA-3) at the Kingsville Dome (KVD) U mine as of 03/12/2009.

Production Schedule for KVD's Well Fields

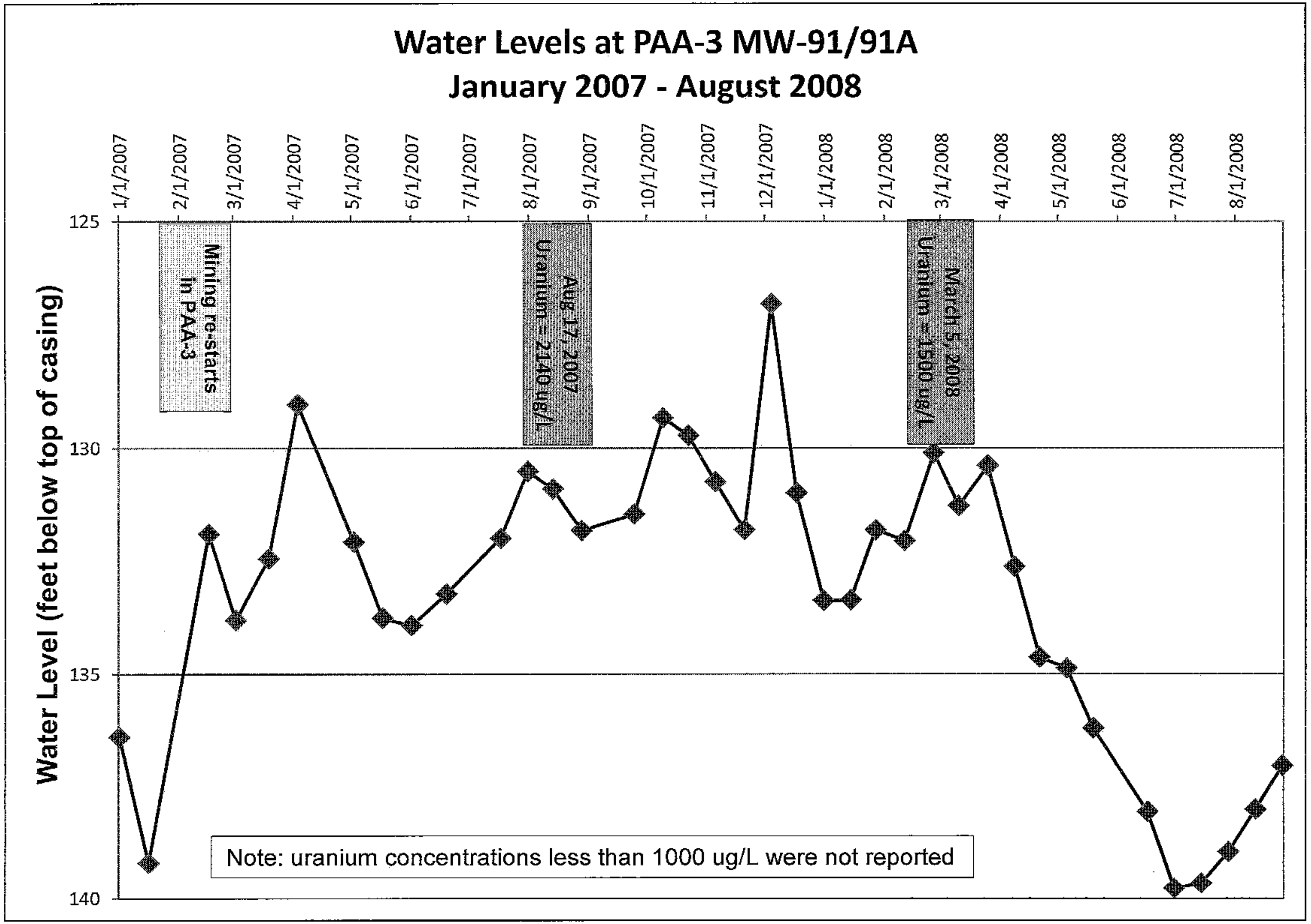
1 Well field 9	06/09/1998 - 04/02/1999
2 Well field 10	07/29/1998 - 04/02/1999
3 Well field 11	04/07/2006 - 09/11/2007
4 Well field 12	08/07/2006 - 09/11/2007
5 Well field 13	02/12/2007 - 12/07/2007
6 Well field 14	07/19/2007 - 06/19/2008
7 Well field 15A	01/18/2008 - 06/17/2009
8 Well field 15B	No Mining Yet
9 Well field 16A	12/22/2007 - 07/09/2008
10 Well field 16B	07/10/2008 - 06/17/2009
11 Well field 17A	04/22/2008 - 10/07/2008
12 Well field 17B	10/08/2008 - 06/17/2009

Details on
Well Fields'
Mining Schedule
at Production
Area 3 (PA-3).

GH=Garcia Hill



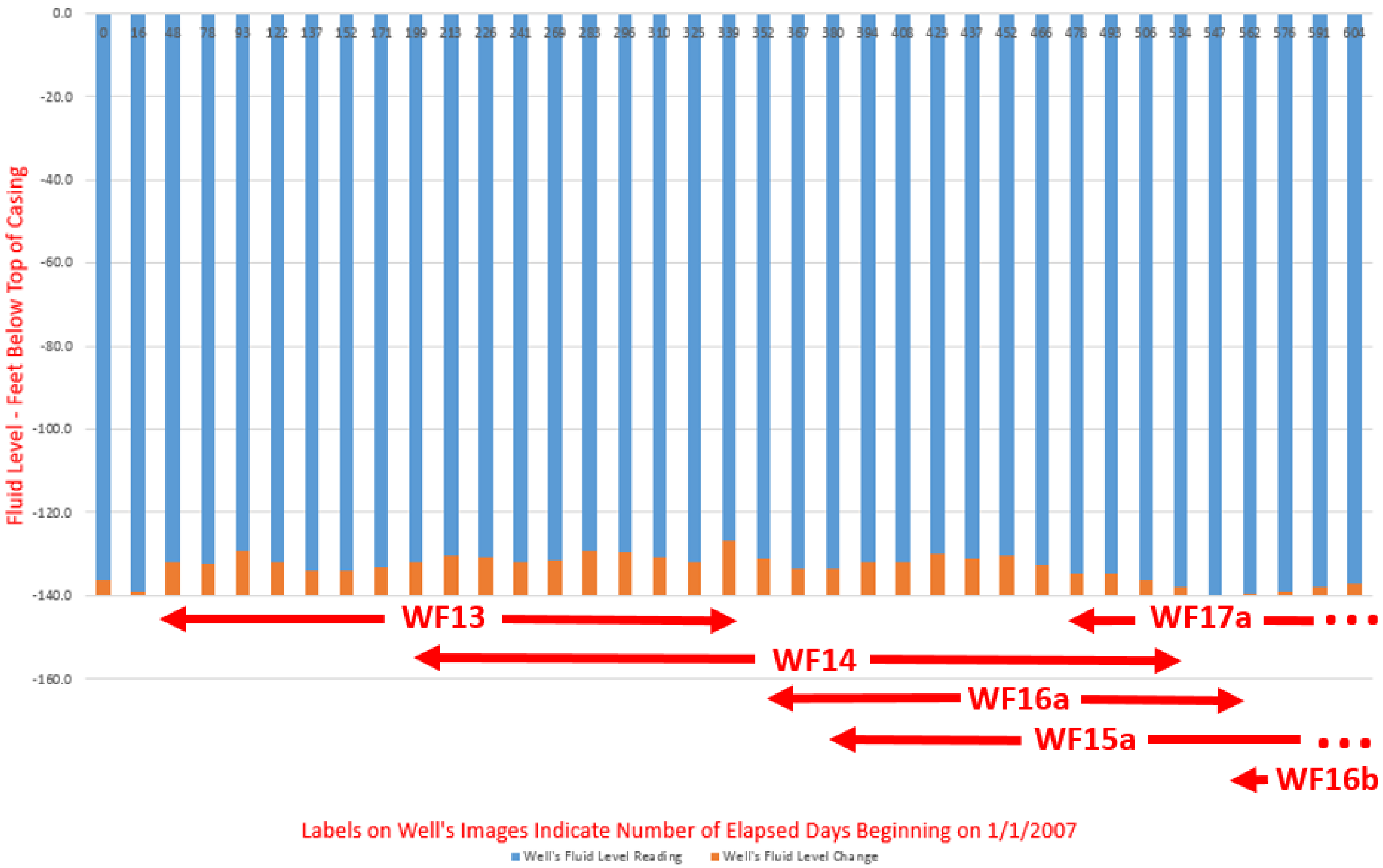
An Example Of Time Lapse Imaging



Data sources: Quarterly Monitor Well Reports submitted by URI to TCEQ, 2007 and 2008

KVD's PA-3 Monitoring Well No. 91

Time Lapse Images of Well's Changing Fluid Levels - 1/1/2007 to 8/1/2008



WF# = Well Field # - Mining Period

Mining at PA-3 Resumed in January, 2007

August 17, 2007: Uranium Concentration: 2140 µg/L (Elapsed Days: 230, approx.)

March 5, 2008: Uranium Concentration: 1500 µg/L (Elapsed Days: 430, approx.)

PA-3 Ceases Production in October, 2009 (Elapsed Days: 1034, approx.)

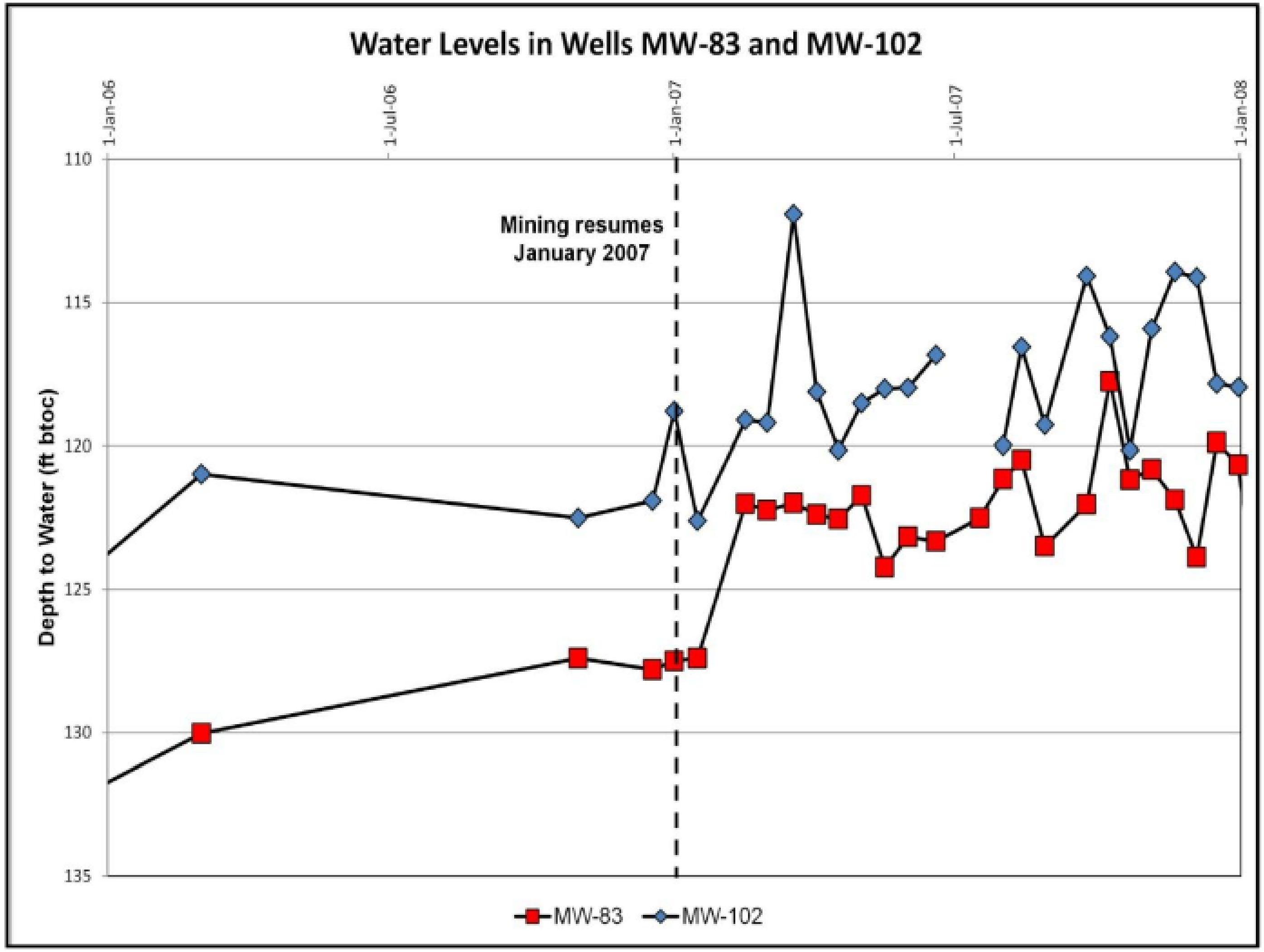
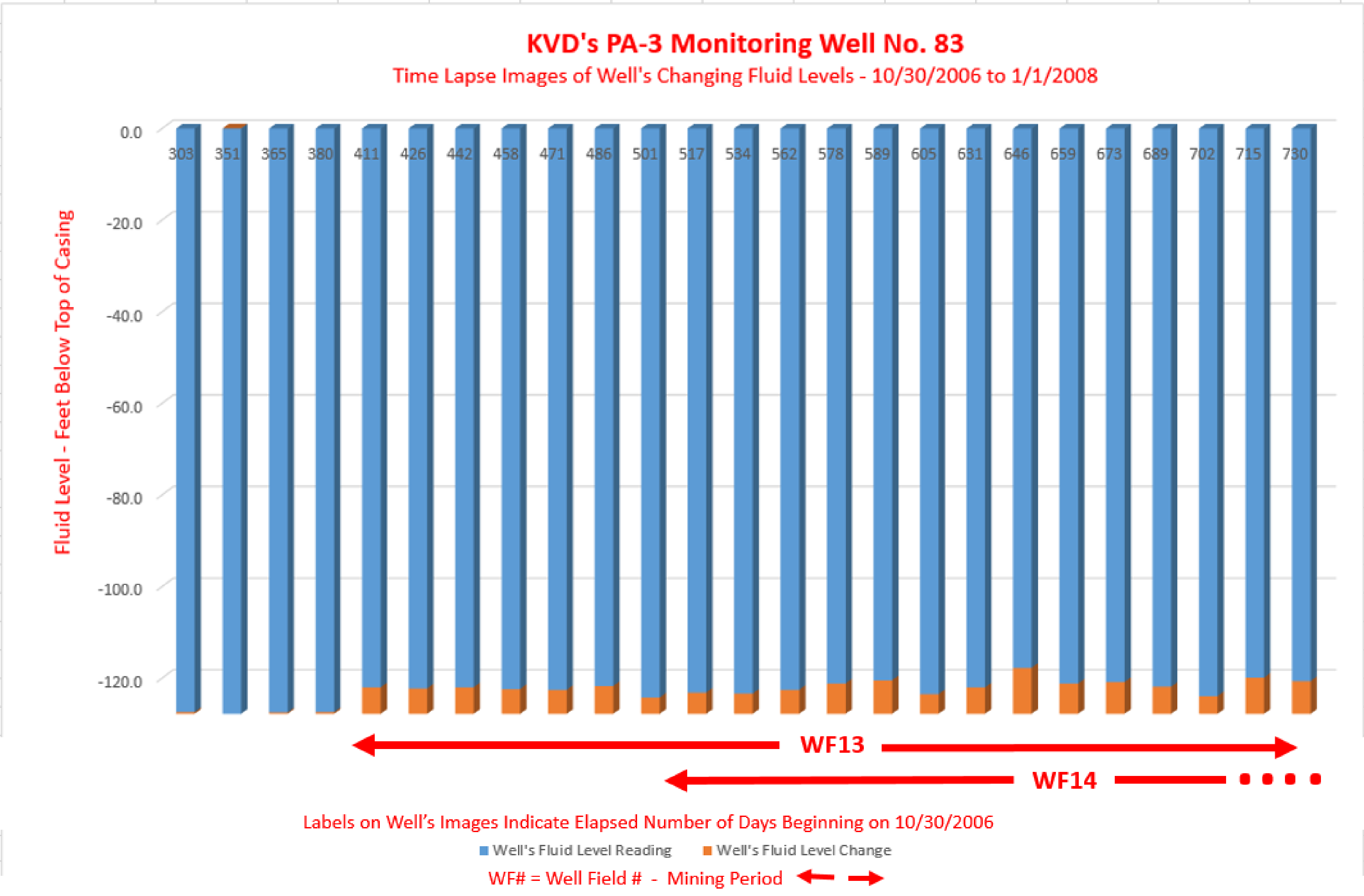
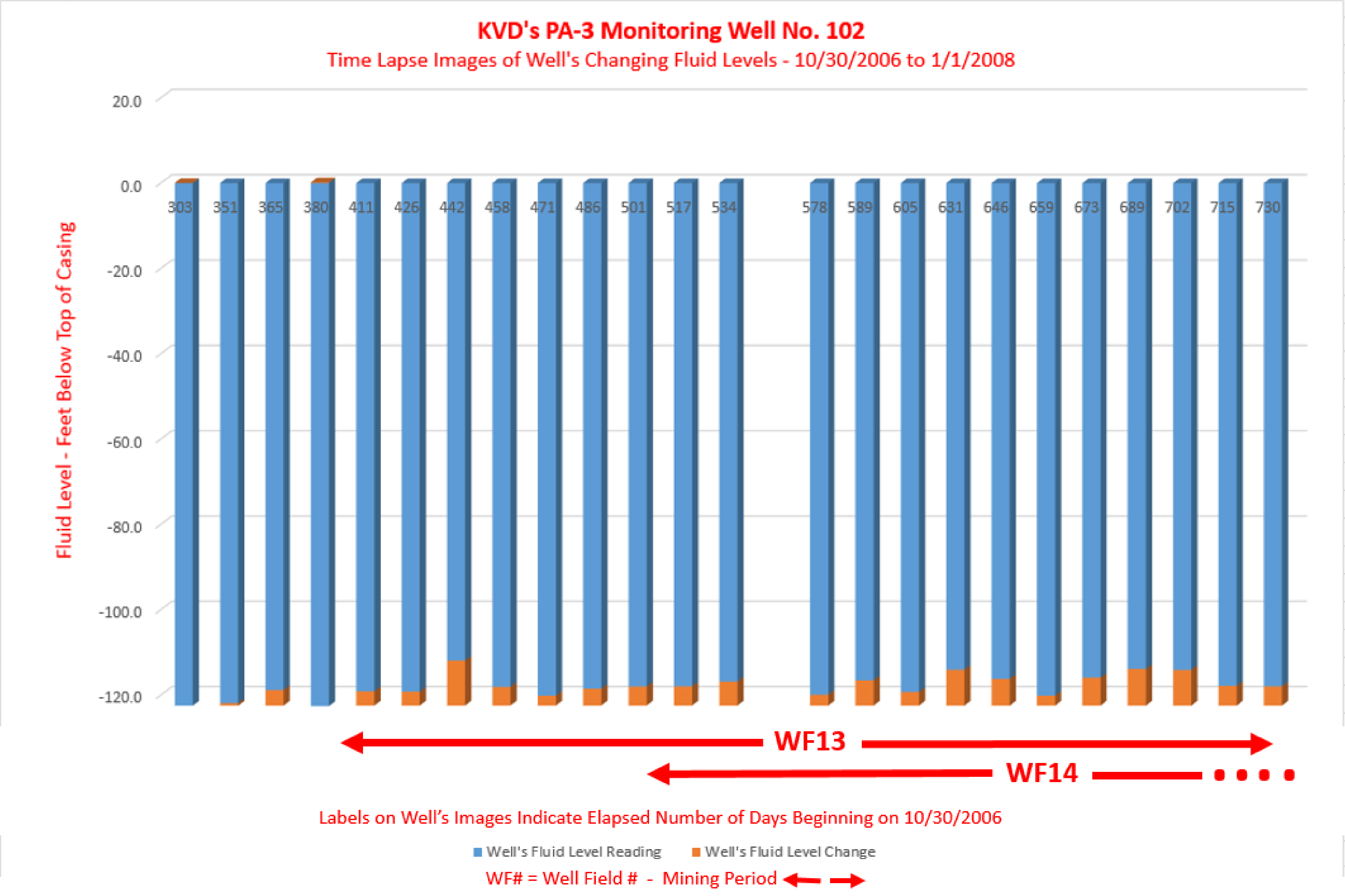


Figure 6. Response of Water Levels to Injection of Leaching Fluids



Mining at PA-3 Resumed in January 2007

PA-3 Ceased Production in October, 2009



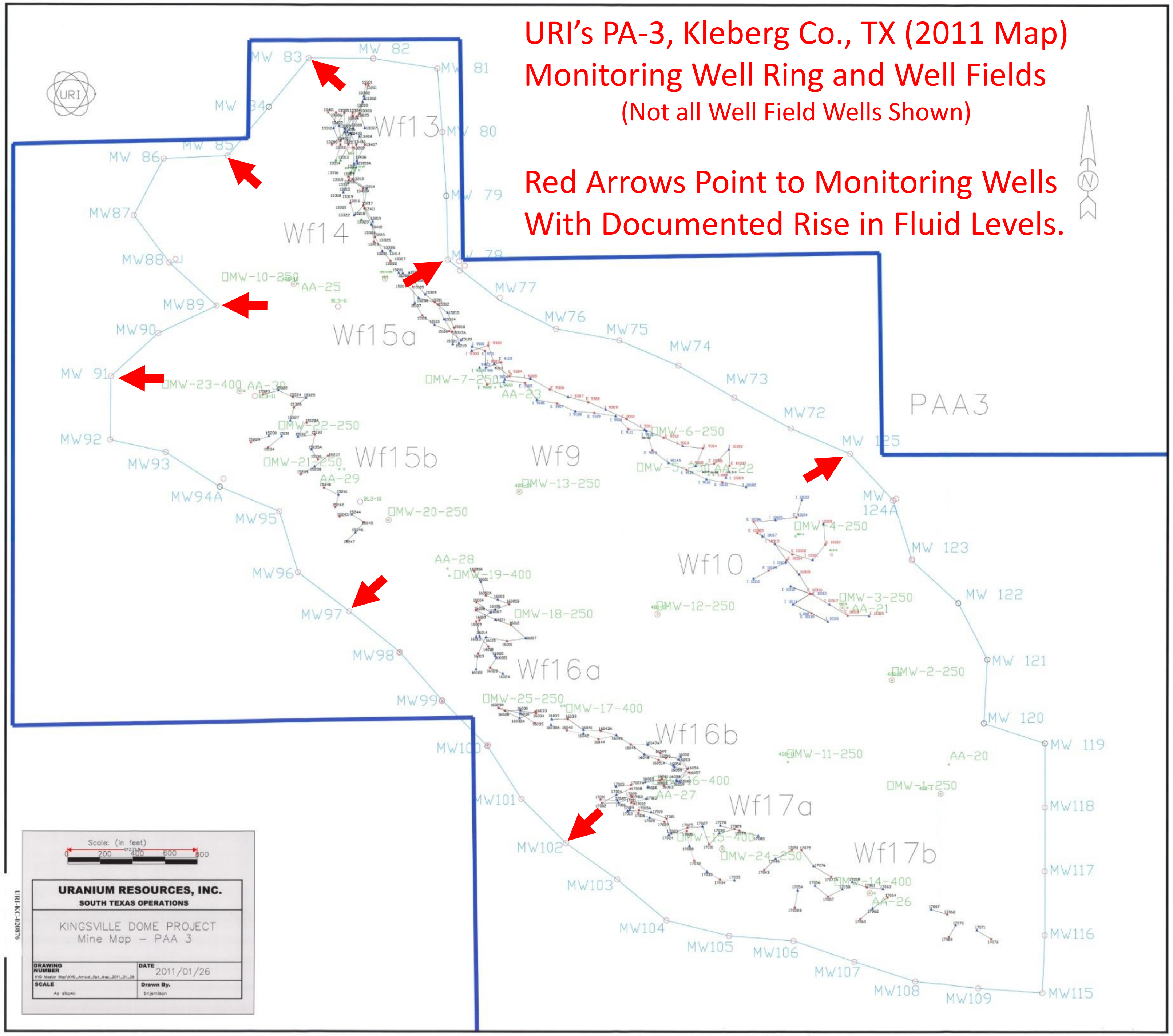
Mining at PA-3 Resumed in January 2007

PA-3 Ceased Production in October, 2009

URI's PA-3, Kleberg Co., TX (2011 Map)
Monitoring Well Ring and Well Fields

(Not all Well Field Wells Shown)

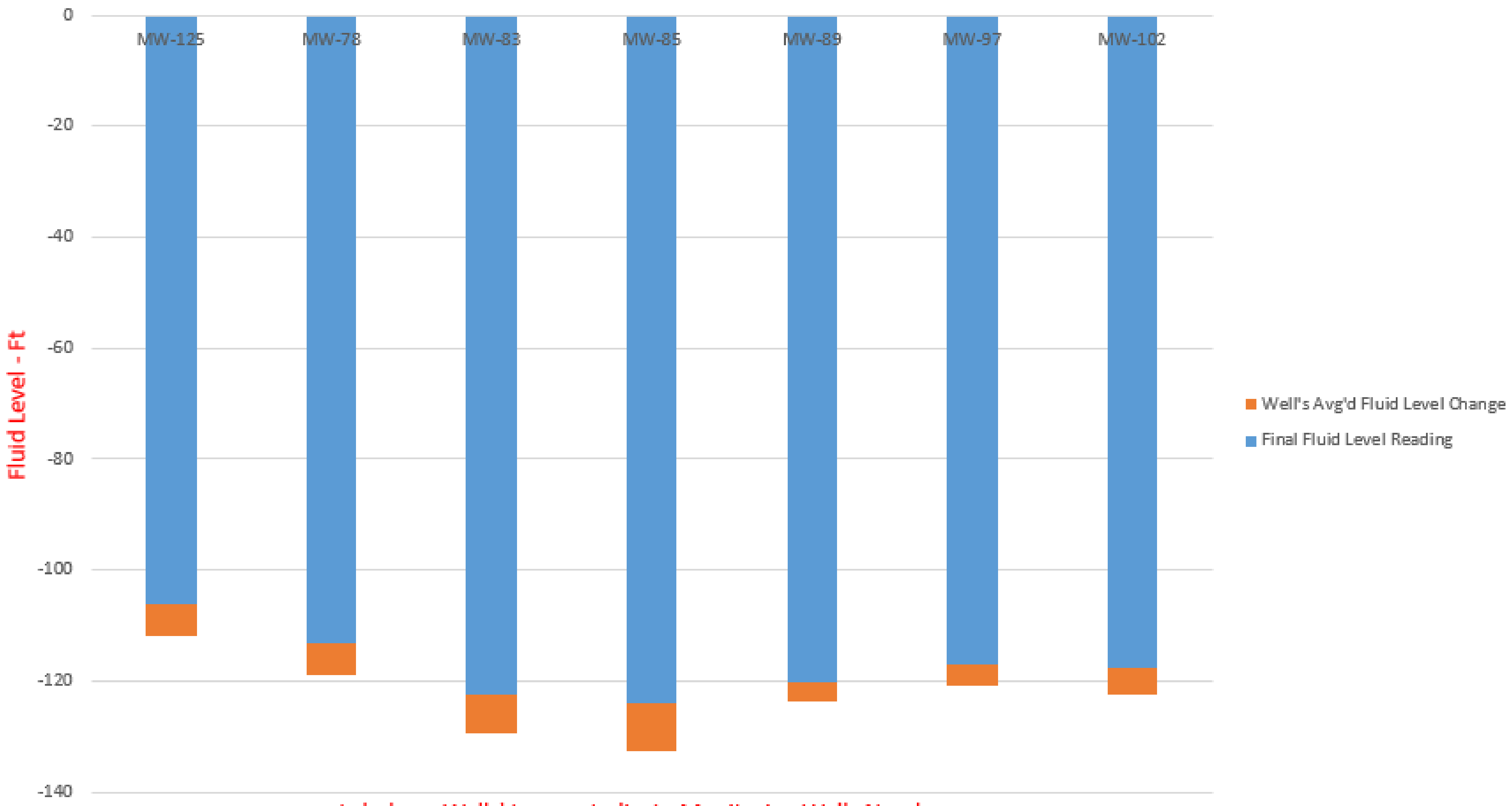
Red Arrows Point to Monitoring Wells With Documented Rise in Fluid Levels.



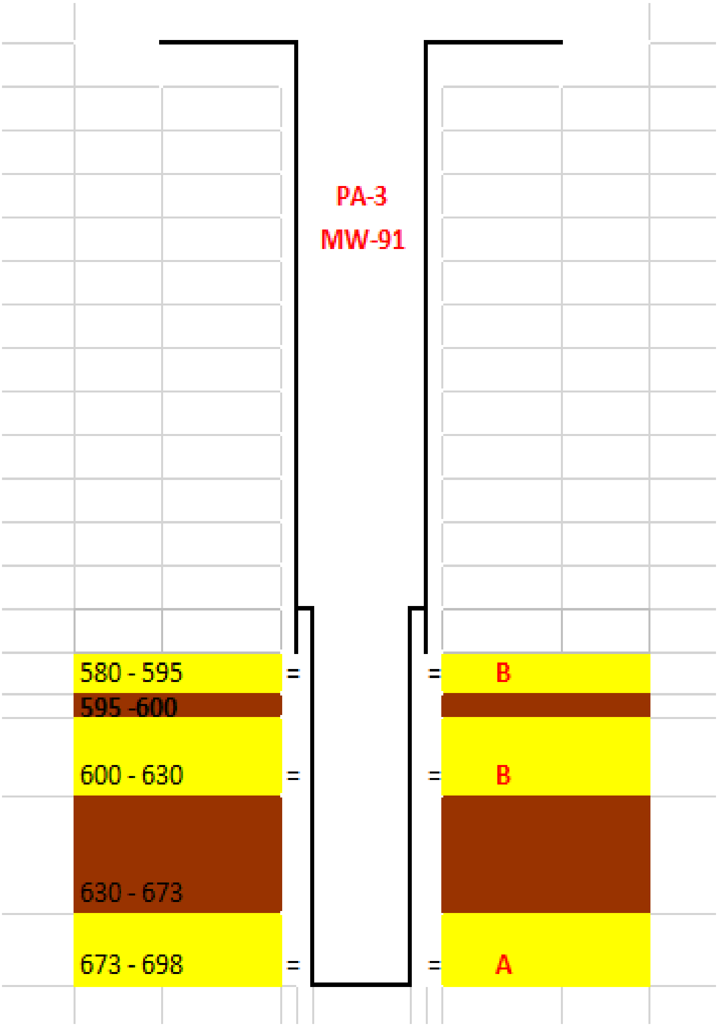
Kingsville Dome PAA-3 Monitor Well Levels

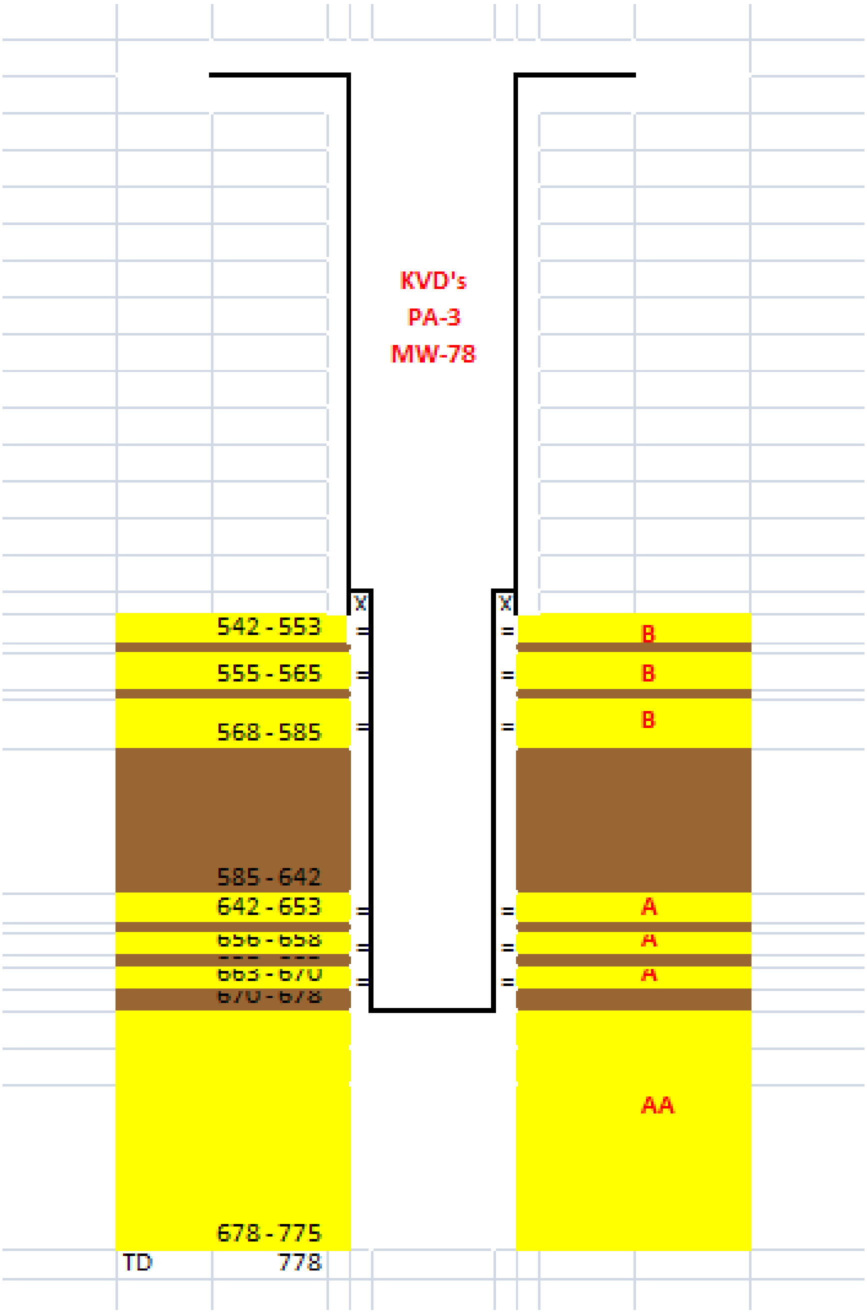
Date	MW-78	MW-83	MW-85	MW-89	MW-97	MW-102	MW-125
03-Nov-08	113.00	120.00	127.00	120.00	119.00	119.00	109.00
17-Nov-08	113.90	121.90	127.39	119.27	116.87	119.59	107.78
01-Dec-08	113.60	122.08	126.81	118.96	116.59	119.64	107.39
15-Dec-08	113.49	122.28	126.72	119.11	116.64	120.43	107.45
31-Dec-08	113.45	122.30	127.69	119.15	116.70	120.36	107.49
12-Jan-09	113.56	122.46	127.00	119.10	116.57	118.79	106.99
26-Jan-09	113.60	121.80	127.07	119.35	117.07	119.70	107.23
09-Feb-09	113.03	121.26	126.65	118.82	117.55	120.15	107.29
23-Feb-09	113.14	121.32	127.12	119.20	117.22	120.21	107.36
09-Mar-09	113.21	121.43	127.28	119.85	117.24	120.40	107.71
23-Mar-09	113.90	121.95	127.35	119.43	117.50	120.60	107.60
06-Apr-09	114.89	122.16	128.26	120.40	118.44	121.29	108.36
20-Apr-09	115.20	122.28	128.80	120.88	118.32	121.93	108.43
06-May-09	117.62	123.22	130.40	122.55	119.33	123.30	110.20
23-May-09	118.27	124.96	132.74	124.54	121.52	125.19	112.04
08-Jun-09	118.31	126.70	132.09	124.04	121.88	124.60	111.59
15-Jun-09	118.42	127.42	133.82	124.40	121.55	125.28	111.93
29-Jun-09	121.70	129.00	134.48	126.27	123.45	125.96	113.46
13-Jul-09	122.49	130.92	137.00	126.80	125.01	127.25	114.85
27-Jul-09	124.08	138.90	144.25	135.24	128.50	128.88	121.48
10-Aug-09	134.75	140.90	146.18	136.85	129.60	129.78	122.96
15-Oct-09	132.35	138.70	144.57	135.33	128.60	128.45	121.54
07-Jan-10	122.90	130.70	136.40	129.05	132.50	too wet	115.80
05-May-10	118.15	125.75	131.20	127.15	128.60	127.80	110.95
13-Jul-10	117.60	124.95	130.60	123.50	124.10	124.15	110.55
12-Oct-10	112.55	120.40	125.40	117.95	118.70	121.75	106.10

KVD PA-3 Monitoring Wells Fluid Level Rise



Labels on Wells' Images Indicate Monitoring Wells Numbers


PA-3
MW-91
580 - 595
595 -600
600 - 630
630 - 673
673 - 698
B
B
A


KVD's
PA-3
MW-78
542 - 553
555 - 565
568 - 585
585 - 642
642 - 653
656 - 658
663 - 670
670 - 678
678 - 775
TD
778
B
B
B
A
A
A
AA

Proof of Fluid Movement **Past** Monitoring Wells Provided by **Water Quality Analysis**

The bar graph shown in Slide 87 and the tabulated water analysis results seen in Slide 88 attest to the quality of the ground water in the area near Garcia Hill as that of drinking water, which calls for protection. These data could have assisted in setting meaningful Upper Control Limits for in-situ solution mining operations at PA-3, which would have made possible the early detection of excursions. The data in Slide 89 show that it was common field practice to overlook every lab result that indicated Uranium concentrations below 1.0 mg/L.

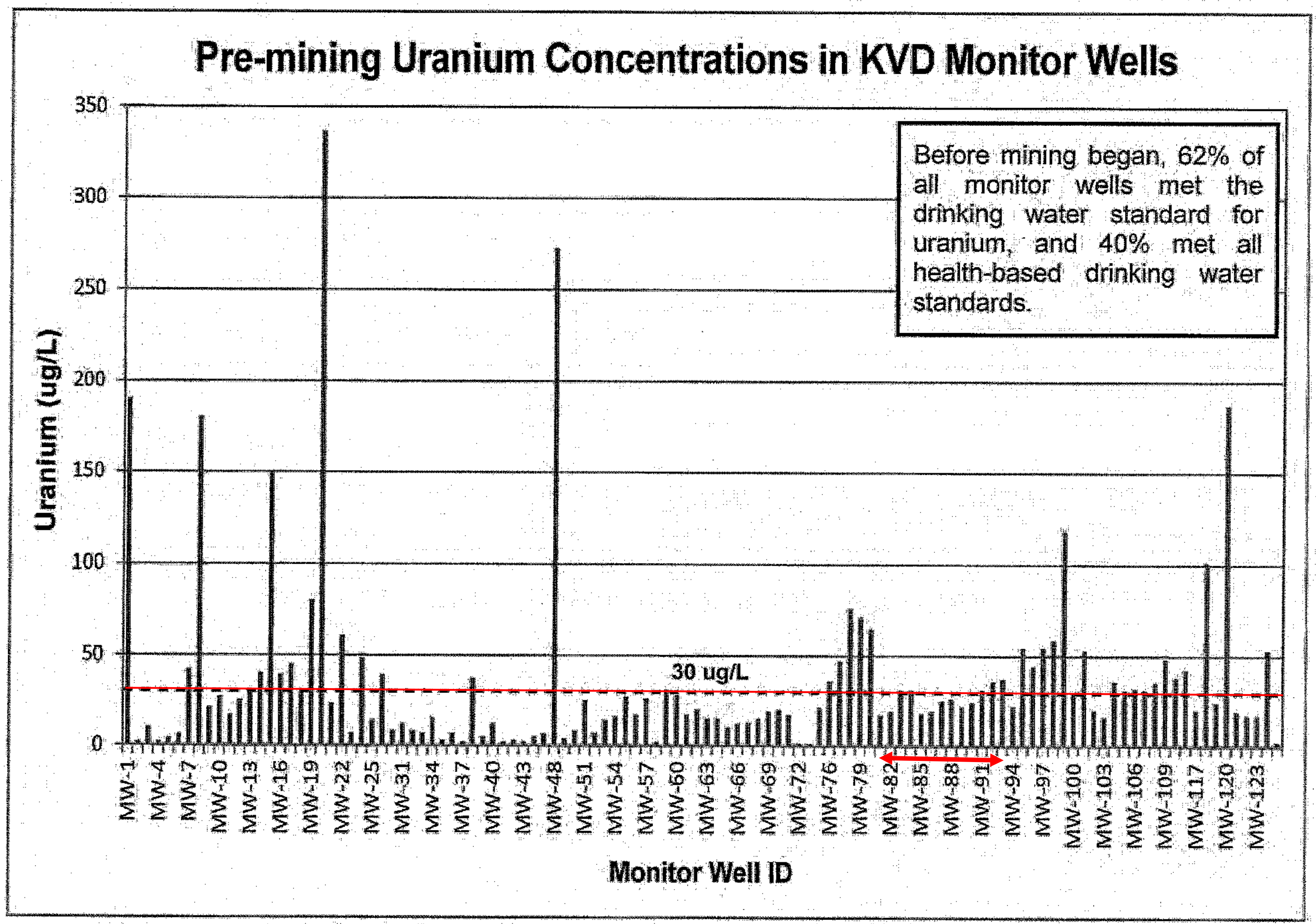
The Water Quality reports seen in Slide 89 are samples of the data source for the table in Slide 90, a portion of which was used by Mr. Rice to prepare his bar graph for five Monitoring Wells, which is shown in Slide 91. His graph highlights the presence of excursions at PA-3.

The twelve Monitoring Wells for which Water Quality Data are shown in Slide 90 are highlighted in the map in Slide 92. As was the case with the fluid level monitoring data, these Water Quality data speak loudly of the movement of fluids in the aquifer during mining operations at PA-3.

Dr. Abitz's 10/21/12 table in Slide 93 also points to the drastic changes in Uranium concentrations observed at several Monitoring Wells at PA-3, concentration changes that can only be explained through the admission to the presence of excursions. Dr. Abitz also provided the correlations between Radium and Uranium concentrations seen in Slide 94, and derived from the lab work at KVD.

In summary, the reviewed field data indicate that mining solutions from KVD's PA-3 operations have migrated into non-exempted portions of the Goliad Aquifer. This conclusion stands regardless of whether one looks at the Uranium concentrations history depicted in Slide 95 or Slide 96. They both equally speak of the same chain of events at PA-3 that led to the results that we know today.

Some other private drinking water supply wells might be impacted in years to come by the high uranium concentration solutions now migrating through the aquifer (see Slide 17).



Data sources: Applications for PAAs 1, 2, and 3, produced by URI in 1987, 1989, and 1997/2002, respectively.

Monitoring Wells MW-81 through MW-93, located near GH, show water Uranium content **at or below MCL**.

Pre-Mining Uranium Concentrations in PA-3's Northernmost Monitoring Wells

Monitoring Well Number	Baseline Uranium Concentration mg/L
MW-81	0.017
MW-82	0.019
MW-83	0.031
MW-84	0.031
MW-85	0.018
MW-86	0.019
MW-87	0.025

Source: Handwritten notes on Operator provided map

URI Inc, Kingsville Dome
PAA 3 (URO2827-031)

Company Name: URI, Inc.
Address: 650 S. Edmonds Ln. #108
Lewisville, Texas 75067
Phone: (972) 219 - 3330

MONITOR WELL # 85
WELLHEAD ELEV. 44.23

	CONDUCTIVITY umhos/cm	URANIUM mg/l	CHLORIDE mg/l
INITIAL BASELINE	1,820	0.018	268
UPPER LIMITS	**3,525**	**6.54**	**554**
SAMPLING DATE			
Jun-21-07	1610	<1	293
Jul-11-07	(Too Wet)	(Too Wet)	(Too Wet)
Jul-28-07	(Too Wet)	(Too Wet)	(Too Wet)
Aug-02-07	1740	0	317
Aug-15-07	1450	<1	244
Aug-30-07	1420	<1	275
Sep-10-07	(too wet)	(too wet)	(too wet)
Sep-27-07	1690	<1	250
Oct-10-07	1830	0	264
Oct-24-07	1450	<1	230
Nov-10-07	1609	<1	250
Nov-27-07	1652	<1	231
Dec-04-07	1565	< 1	217
Dec-20-07	1605	0	217
Jan-05-08	1670	0	233
Jan-21-08	2000	<1	299
Feb-01-08	1948	<1	266
Feb-18-08	1964	0	286
Mar-03-08	1812	0	253
Mar-14-08	2150	0	239
Mar-27-08	2220	<1	306
Apr-15-08	1626	<1	226
Apr-26-08	1640	<1	233
May-12-08	1638	<1	233
May-27-08	2080	<1	233

URI Inc, Kingsville Dome
PAA 3 (URO2827-031)

Company Name: URI, Inc.
Address: 650 S. Edmonds Ln. #108
Lewisville, Texas 75067
Phone: (972) 219 - 3330

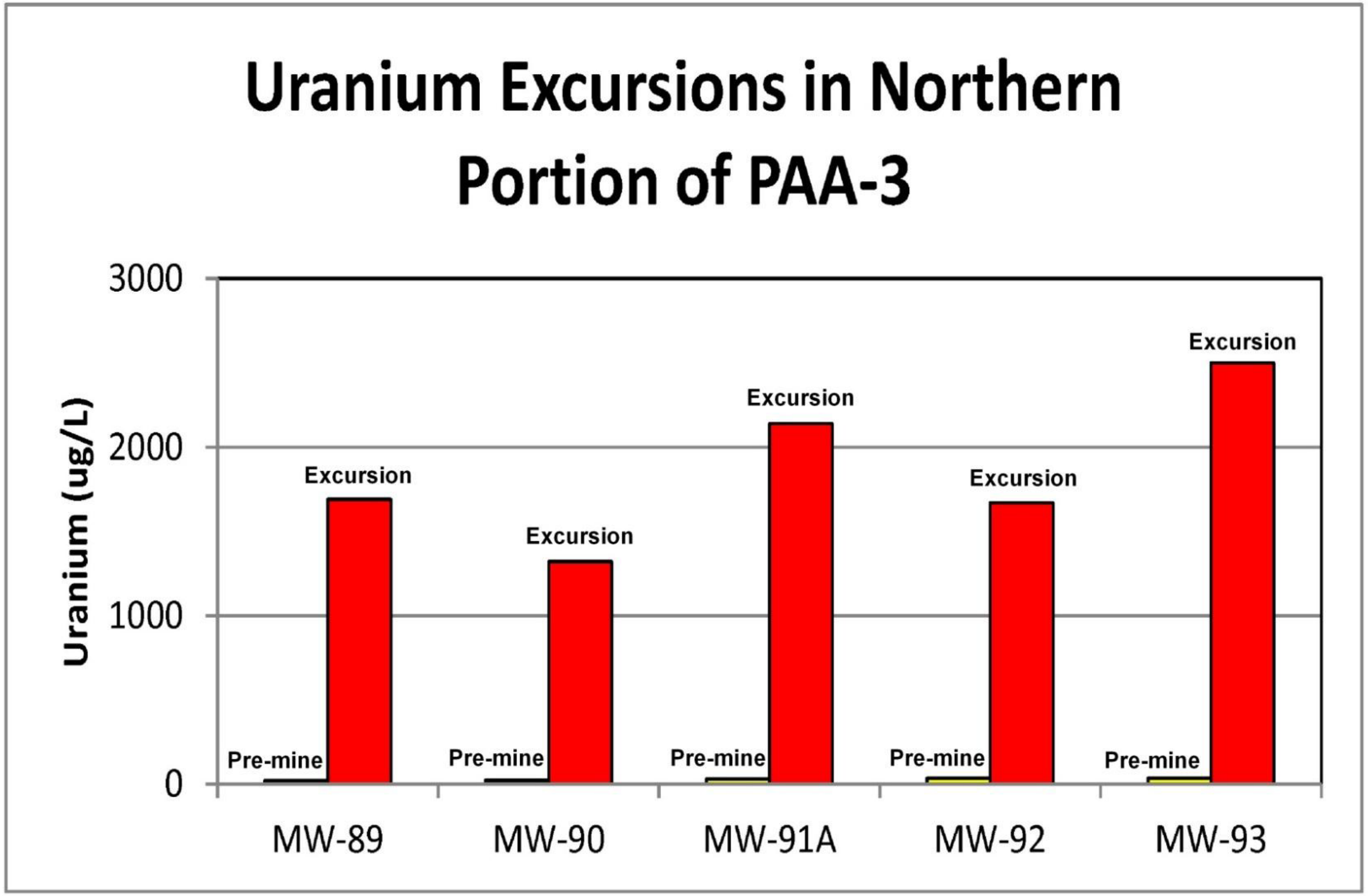
MONITOR WELL # 105
WELLHEAD ELEV. 36.52

	CONDUCTIVITY umhos/cm	URANIUM mg/l	CHLORIDE mg/l
INITIAL BASELINE	1,710	0.031	221
UPPER LIMITS	**3,525**	**6.54**	**554**
SAMPLING DATE			
Jul-13-07	(Too Wet)	(Too Wet)	(Too Wet)
Jul-28-07	(Too Wet)	(Too Wet)	(Too Wet)
Aug-03-07	(Too Wet)	(Too Wet)	(Too Wet)
Aug-17-07	1520	2.32	277
Aug-31-07	(Too Wet)	(Too Wet)	(Too Wet)
Sep-05-07	(too wet)	(too wet)	(too wet)
Sep-14-07	(too wet)	(too wet)	(too wet)
Oct-01-07	(too wet)	(too wet)	(too wet)
Oct-18-07	1480	<1	236
Oct-26-07	1660	<1	245
Nov-13-07	1676	<1	238
Nov-27-07	1540	<1	219
Dec-10-07	Too Wet	Too Wet	Too Wet
Dec-21-07	1606	<1	199
Jan-05-08	1610	0	226
Jan-23-08	1572	<1	213
Feb-06-08	1566	<1	219
Feb-21-08	1655	0	219
Mar-05-08	1697	<1	226
Mar-14-08	1648	0	219
Mar-31-08	1650	0	213
Apr-14-08	1577	<1	206
Apr-24-08	1500	<1	219
May-08-08	1681	<1	219
May-22-08	1793	<1	239

KVD's PA-3 MONITORING WELLS

Lab Documented Excursions

Well	Date	U - mg/L
MW89	8/17/2007	1.69
MW90	8/17/2007	1.32
MW91	8/17/2007	2.14
MW92	8/17/2007	1.67
MW93	10/11/2007	2.50
MW100	8/17/2007	3.60
MW101	8/17/2007	2.52
MW102	8/17/2007	5.17
MW103	8/17/2007	2.78
MW104	8/17/2007	2.14
MW105	8/17/2007	2.32
MW106	8/17/2007	1.26



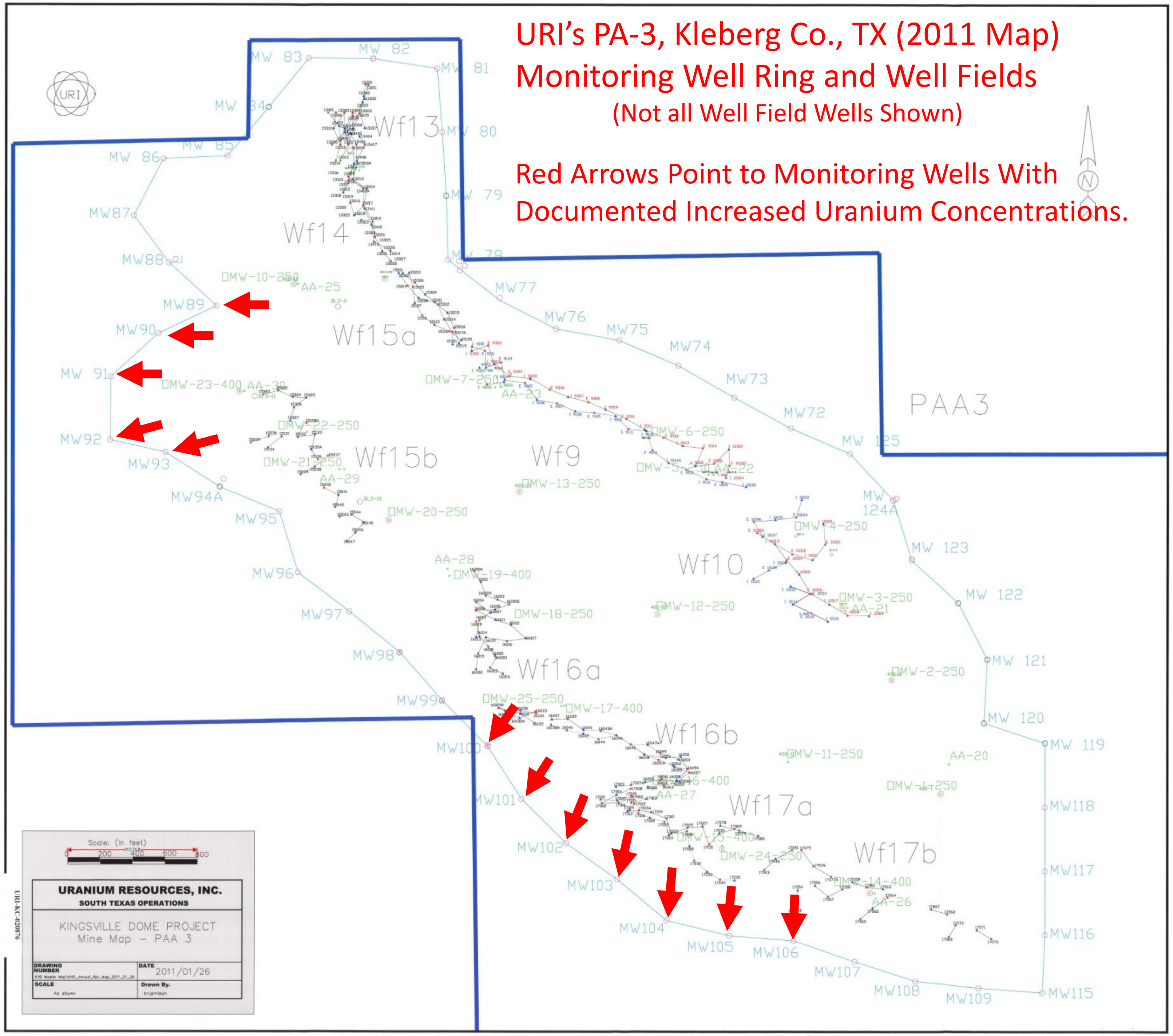
Data sources: application for PAA-3 (URI, 1997/2002); and 2008 2nd Quarter Monitor Well Report (URI, 2008). Uranium concentrations less than 1000 ug/L are usually not reported by URI.

Note: Excursions shown occurred in 2007. Not reported to TCEQ because concentrations were less than excursion value defined in permit: 6540 ug/L.

URI's PA-3, Kleberg Co., TX (2011 Map) Monitoring Well Ring and Well Fields

(Not all Well Field Wells Shown)

Red Arrows Point to Monitoring Wells With Documented Increased Uranium Concentrations.

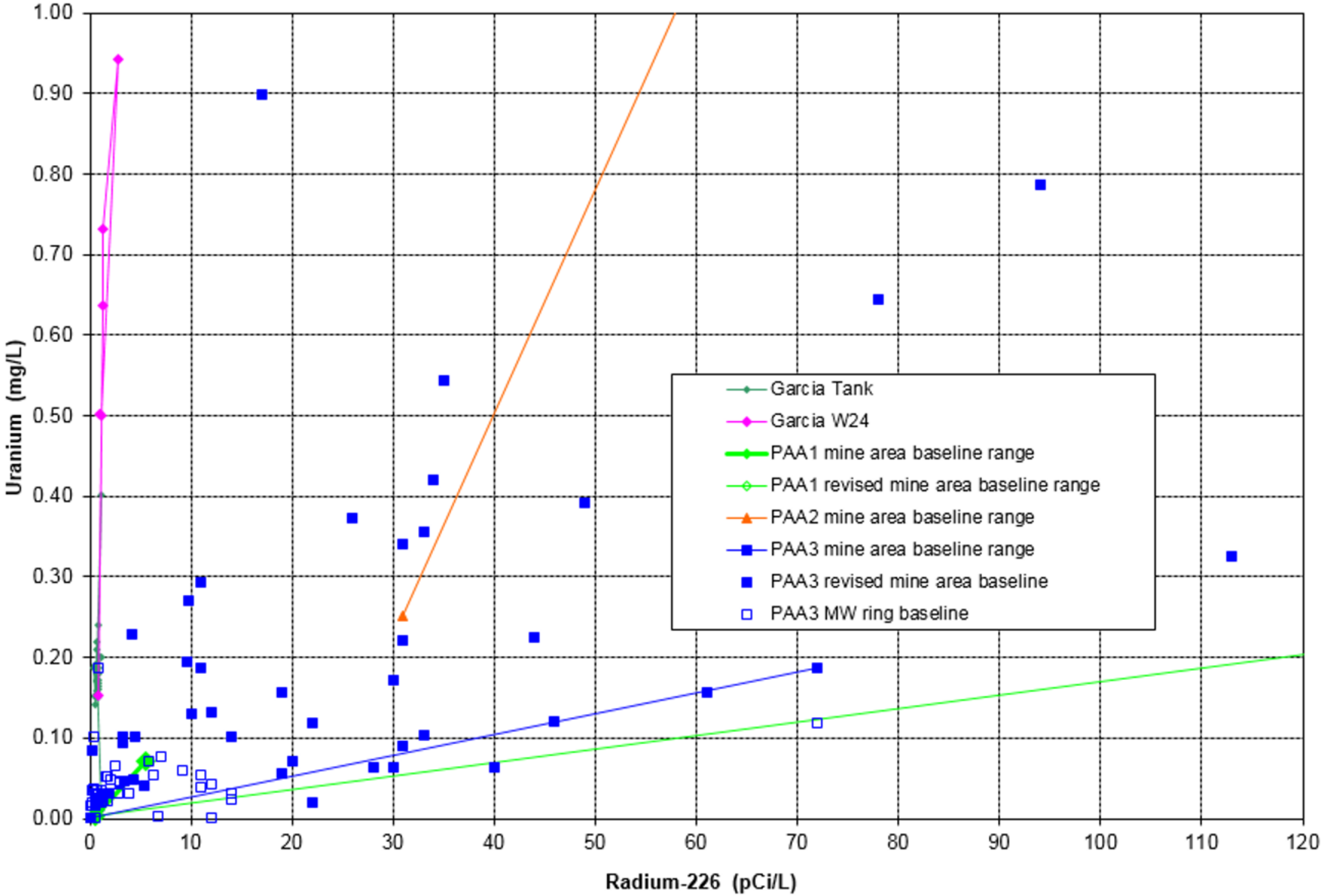


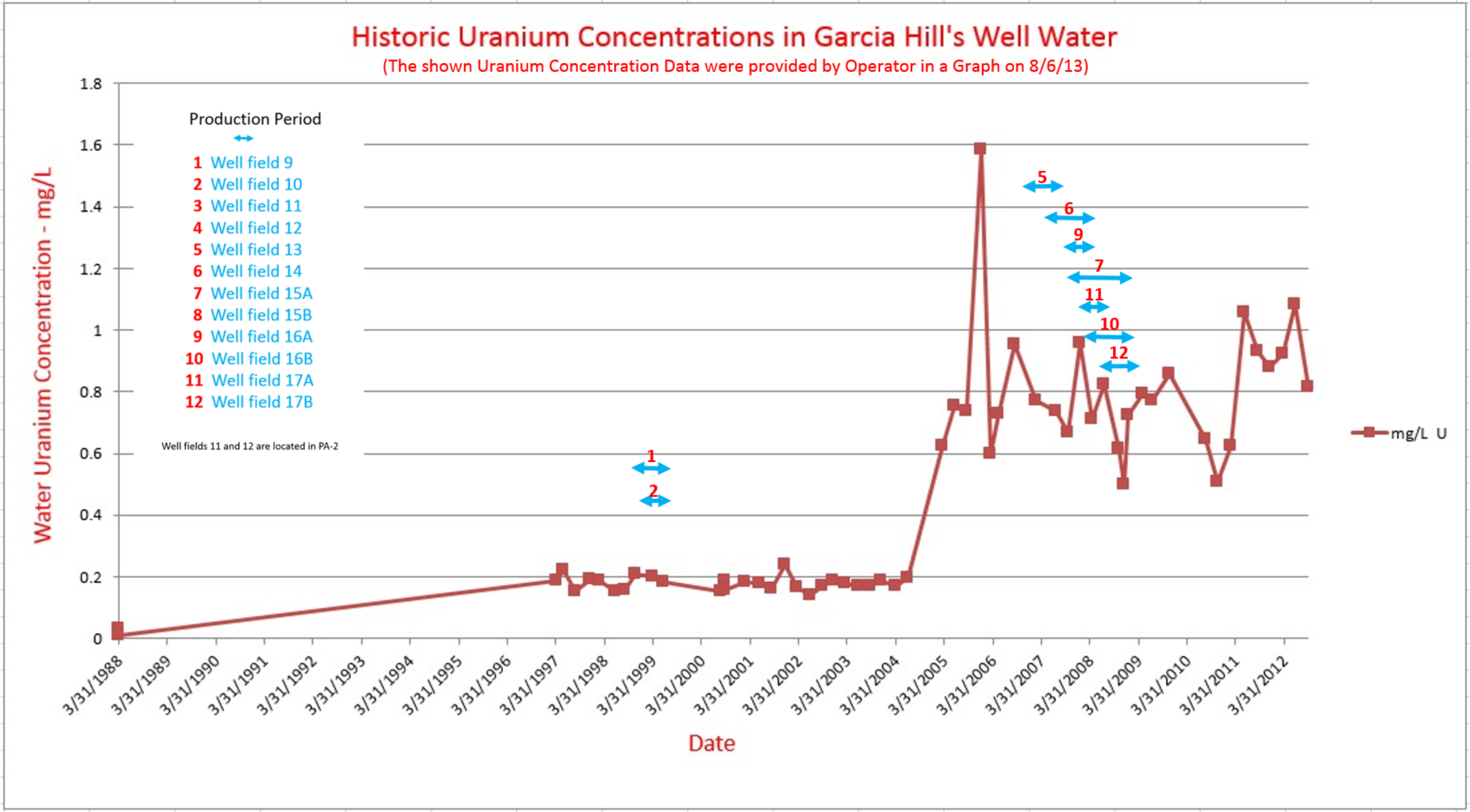
Lab Results for Base Line (BL) Wells and Monitoring Wells (MWs) - KVD's PA-3

(Table of Values provided by Dr. R. Abitz on 10/21/2012)

V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
			Revised baseline 4/9/02					Monitor well baseline				MW contamination	
			PAA3					PAA3				PAA3	
			U (mg/L)	Ra-226 (pCi/L)				U (mg/L)	Ra-226 (pCi/L)			U (mg/L)	
	BL8501	18-Jun-97	0.094	3.3		72	28-Mar-97	0.001	12	89	10-Apr-97	0.022	
	BL8502	8-May-97	0.032	1.9		73	7-Apr-97	0.001	0.5	89	17-Aug-07	1.69	
	BL8503	12-May-97	0.101	4.4		74	7-Apr-97	0.021	0.6				
	BL8504	12-May-97	0.101	14		75	7-Apr-97	0.001	0.1	90	10-Apr-97	0.024	
	BL8505	13-May-97	0.047	3.4		76	7-Apr-97	0.036	1.2	90	17-Aug-07	1.32	
	BL8506	2-Jun-97	0.041	5.3		77	23-Apr-97	0.047	2.9				
	BL8507	8-May-97	0.194	9.6		78	6-Mar-97	0.076	7	91	10-Apr-97	0.031	
	BL8508	1-May-97	0.229	4.2		79	10-Apr-97	0.071	5.9	91	17-Aug-07	2.14	
	BL8509	13-May-97	0.084	0.3		80	10-Apr-97	0.065	2.5				
	BL8510	28-May-97	0.101	3.2		81	9-Apr-97	0.017	0.6				
	BL8511	6-May-97	0.049	4.3		82	29-Apr-97	0.019	1.2				
	9107	27-Apr-98	0.543	35		83	6-Mar-97	0.031	14				
	9308	22-Apr-98	0.899	17		84	11-Apr-97	0.031	2.8				
	9310	22-Apr-98	0.224	44		85	11-Apr-97	0.018	0.6				
	9113	24-Apr-98	0.421	34		86	7-Apr-97	0.019	0.3				
	9314	27-Apr-98	0.186	11		87	9-Apr-97	0.025	0.6				
	9315	27-Apr-98	0.293	11		88	9-Apr-97	0.026	0.8				
	9101	8-Jun-98	0.372	26		89	10-Apr-97	0.022	1.7				
	9103	8-Jun-98	0.131	12		90	10-Apr-97	0.024	14				
	9105	8-Jun-98	0.391	49		91	10-Apr-97	0.031	3.8				
	9308	8-Jun-98	0.787	94		92	10-Apr-97	0.036	0.7				
	9109	8-Jun-98	1.5	46		93	10-Apr-97	0.037	0.4				
	9111	8-Jun-98	0.172	30		94	11-Apr-97	0.022	1.3				
	9302	8-Jun-98	0.064	40		95	23-Apr-97	0.054	11				
	9304	8-Jun-98	0.644	78		96	15-Apr-97	0.044	2.9				
	9310	8-Jun-98	1.03	57		97	15-Apr-97	0.054	6.3				
	9312	8-Jun-98	0.356	33		98	15-Apr-97	0.059	9.1				
	9314	27-Jul-98	0.375	239		99	23-Apr-97	0.118	72				
	2022	27-Jul-98	0.063	28		100	28-Apr-97	0.03	0.9				
	2040	27-Jul-98	0.072	20		101	23-Apr-97	0.053	1.6				
	9306	8-Jun-98	1.54	51		102	10-Mar-97	0.02	0.8				
	9602	8-Jun-98	0.27	9.8		103	13-Mar-97	0.016	0.1				
	2019	27-Jul-98	0.156	19		104	28-Apr-97	0.036	0.3				
	1050	28-Jul-98	0.13	10		105	28-Apr-97	0.031	0.5				
	2048	27-Jul-98	0.156	61		106	29-Apr-97	0.032	0.5				
	2046	27-Jul-98	0.064	30		107	29-Apr-97	0.031	0.9				
	1030	29-Jul-98	0.121	46		108	29-Apr-97	0.035	0.3				
	2021	27-Jul-98	0.056	19		109	5-May-97	0.048	2				
	1347	28-Jul-98	0.34	31		115	7-May-97	0.038	11				
	2047	27-Jul-98	0.222	31		116	7-May-97	0.042	12				
	1050	28-Jul-98	0.019	22		117	7-May-97	0.02	0.9				
	1049	28-Jul-98	0.118	22		118	11-Apr-97	0.101	0.4				
	1114	28-Jul-98	0.103	33		119	11-Apr-97	0.024	1				
	1120	28-Jul-98	0.326	113		120	2-Apr-97	0.187	0.8				
	1032	27-Jul-98	0.091	31		121	11-Apr-97	0.019	0.7				
						122	11-Apr-97	0.017	0.5				
						123	29-Apr-97	0.017	0.3				
						124	15-Apr-97	0.053	1.7				
						125	28-Mar-97	0.002	6.8				

UvsRa - From Dr. Abitz, 10/21/2012





Historic Uranium Concentrations in Garcia Hill's Well Water
(The shown Uranium Concentration Data were provided by Operator in a Graph on 8/6/13)
Production Period
1 Well field 9
2 Well field 10
3 Well field 11
4 Well field 12
5 Well field 13
6 Well field 14
7 Well field 15A
8 Well field 15B
9 Well field 16A
10 Well field 16B
11 Well field 17A
12 Well field 17B
Well fields 11 and 12 are located in PA-2
Water Uranium Concentration - mg/L
Date
mg/L U
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
3/31/1988
3/31/1989
3/31/1990
3/31/1991
3/31/1992
3/31/1993
3/31/1994
3/31/1995
3/31/1996
3/31/1997
3/31/1998
3/31/1999
3/31/2000
3/31/2001
3/31/2002
3/31/2003
3/31/2004
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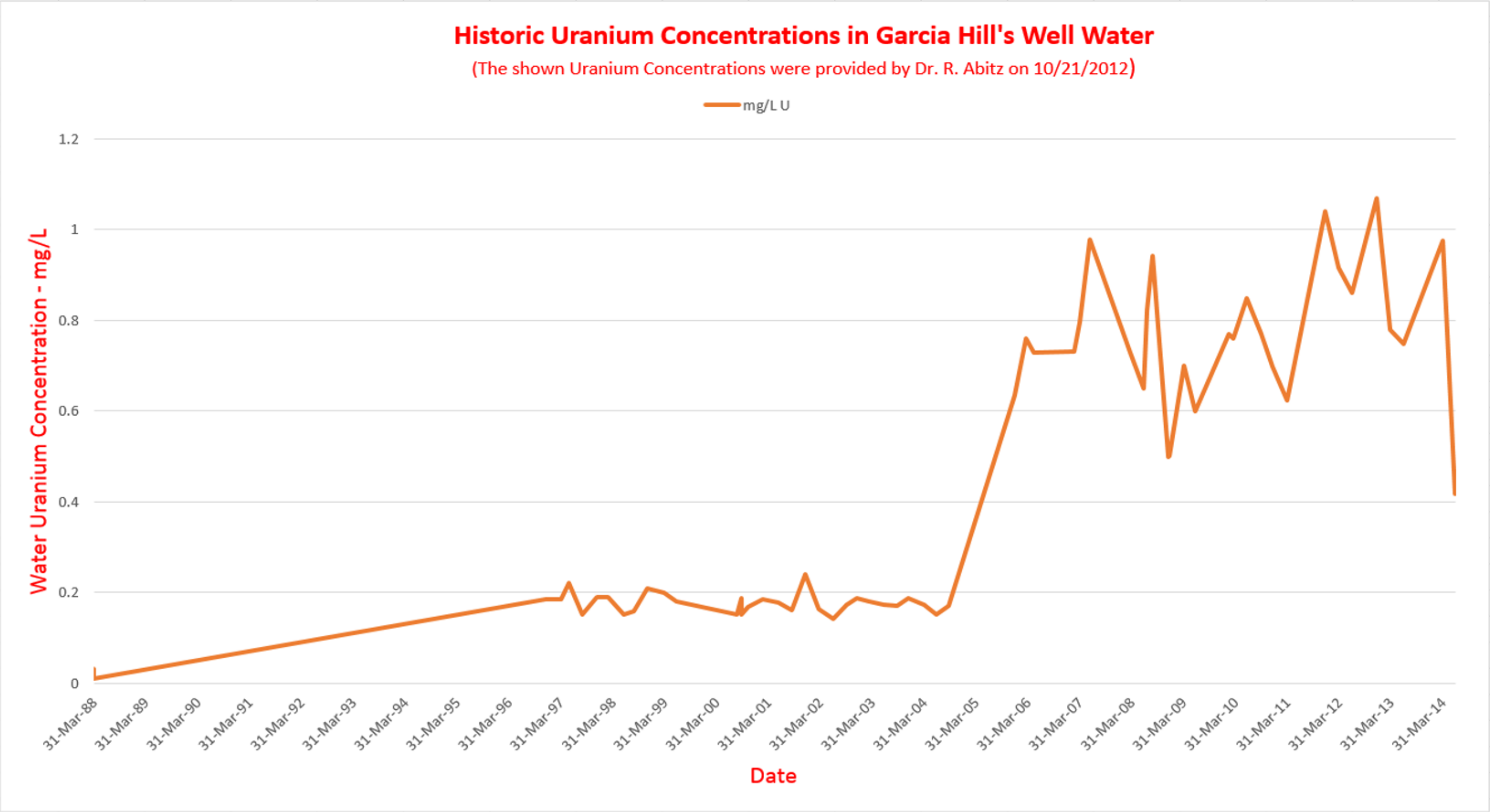
3/31/2010
3/31/2011
3/31/2012



Historic Uranium Concentrations in Garcia Hill's Well Water
(The shown Uranium Concentrations were provided by Dr. R. Abitz on 10/21/2012)
mg/L U
1.2
1
0.8
0.6
0.4
0.2
0
Water Uranium Concentration - mg/L
31-Mar-88
31-Mar-89
31-Mar-90
31-Mar-91
31-Mar-92
31-Mar-93
31-Mar-94
31-Mar-95
31-Mar-96
31-Mar-97
31-Mar-98
31-Mar-99
31-Mar-00
31-Mar-01
31-Mar-02
31-Mar-03
31-Mar-04
31-Mar-05
31-Mar-06
31-Mar-07
31-Mar-08
31-Mar-09
31-Mar-10
31-Mar-11
31-Mar-12
31-Mar-13
31-Mar-14
Date

Permeability Values for the Goliad Aquifer

The graph in Slide 98 presents the pressure distribution about a production well for four time periods. The graph was developed based on the results of a Goliad Aquifer well's pumping test in Kleberg County, and presented in the Texas Water Development Board Report No. 173 of 1973.

An estimate of the Aquifer Permeability has been obtained through the use of a solution to the diffusivity equation in order to match the Drawdown Value highlighted by the red arrow in the graph, that is, the pressure drawdown in the aquifer at 100 feet from the well, after 365 Days of operation. A Permeability Value was estimated using the Excel computer program illustrated in Slide 99.

As seen on Slide 99, a Permeability-Thickness (kh) of approximately 1.1×10^6 md-Ft was indicated, which, based on information provided in the TWDB Report, translates into a Permeability Value of approximately 4980 md.

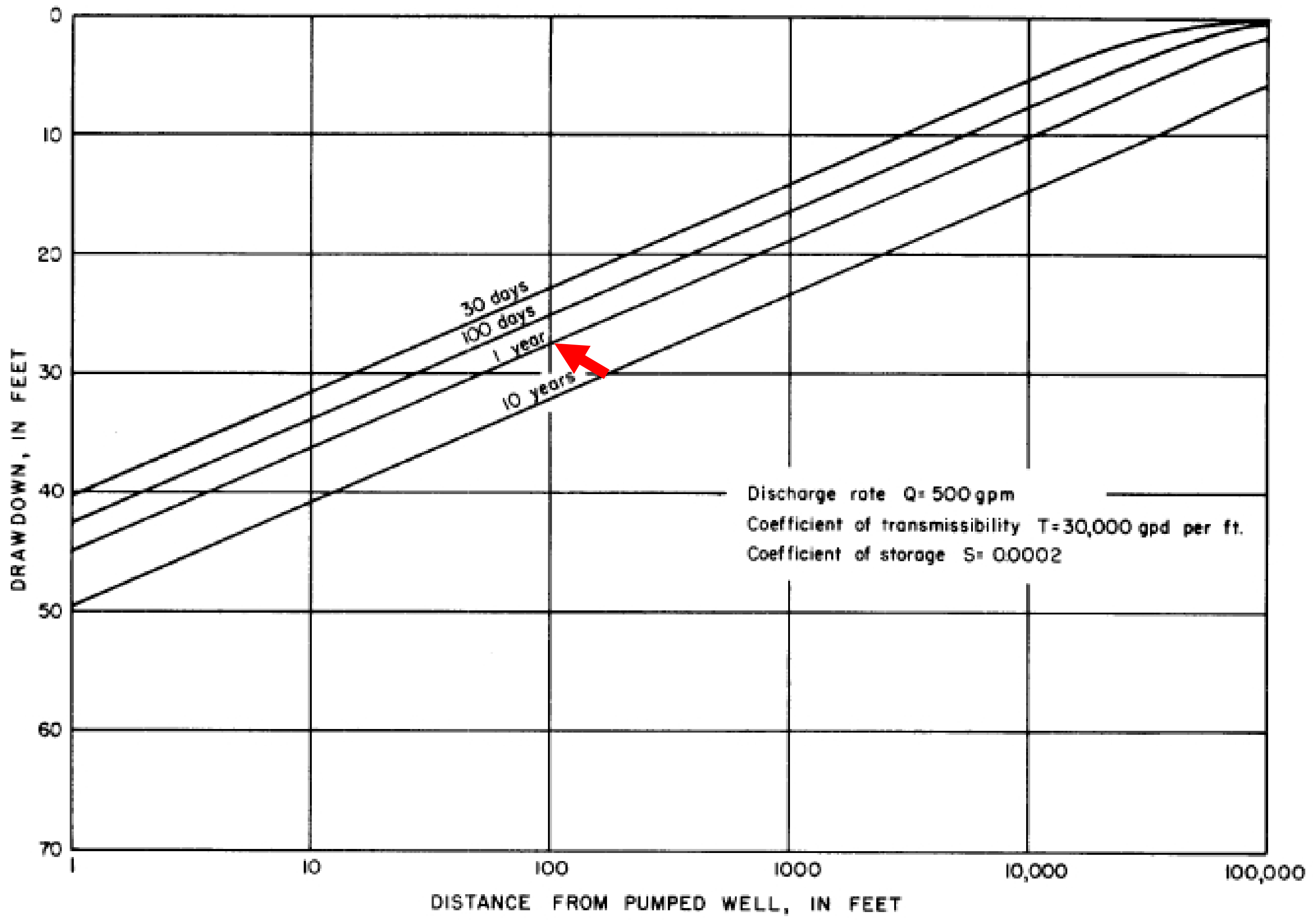


Figure 6.—Relation of Drawdown to Time and Distance as a Result of Pumping Under Artesian Conditions

FLOW OF FLUIDS IN POROUS MEDIA

Reservoir Pressure Effects Computations

Production Rate (STBbl/Day)	17143
Time of Operation (Days)	365
Initial Reservoir Pressure (psia)	400
Injected Fluid Viscosity (cp)	0.76
Formation Volume Factor (ResBbl/STBbl)	1
Formation Porosity (Percent)	35
Formation Permeability (md)	4980
Formation Interval Thickness (Ft)	230
Formation Compressibility (1/psi)	1.90E-06
Specified Radius (Ft)	100
Computed Pressure Change @ Specified Radius (psia)	-12.41
Resulting Reservoir Pressure @ Specified Radius (psia)	**387.6**

Compute Diffusivity Factor

Numerator	31.4736
Denominator	5.05E-07
Diffusivity Factor =	6.23E+07

Compute "x"

Numerator	10000
Denominator	9.09E+10
x =	1.10E-07

Compute Ei(-x)

	3.0242E-15
	7.3915E-23
	1.5243E-30
	2.6824E-38
Ei(-x)	-15.45

Drawdown - Ft	kh - md-Ft
-27.29045902	1145400

Converting a Flow Rate Given in Gals/min to Bbl/Day

$$500\,\frac{\cancel{\text{Gals}}}{\cancel{\text{min}}} * \left\{ \frac{\text{Bbl}}{42\,\cancel{\text{Gals}}} * \frac{60\,\cancel{\text{min}}}{\cancel{\text{Hr}}} * \frac{24\,\cancel{\text{Hr}}}{\text{Day}} \right\} = \quad 17143\,\frac{\text{Bbl}}{\text{Day}}$$